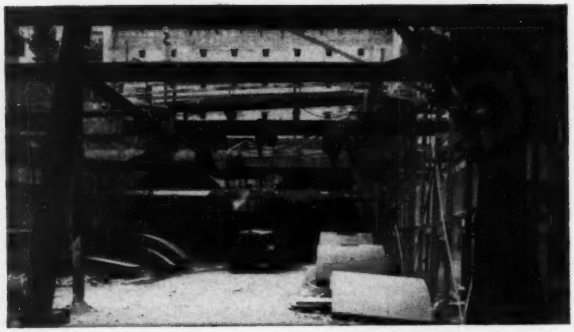
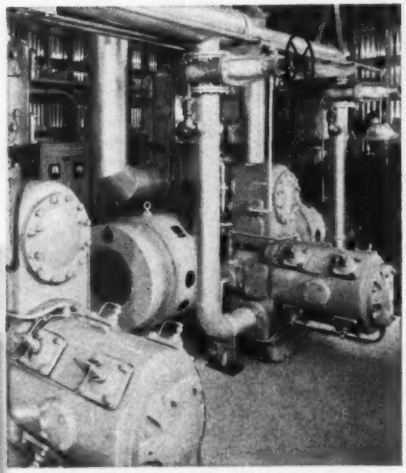
35 CENTS

CONSTRUCTION
METHODS AND EQUIPMENT

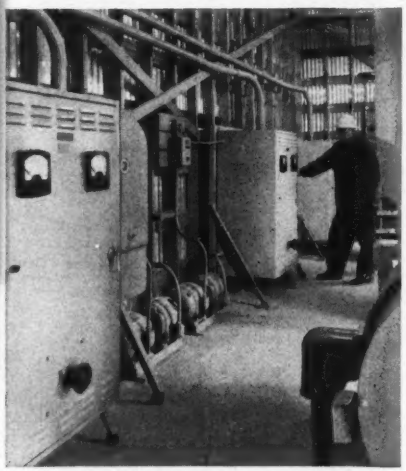
November 1951

San Francisco's new twin-bore tunnel will be 3400 ft long portal-to-portal with a 1600-ft enclosed bore. Air for the construction tools and equipment is distributed from a central source under 100-lb pressure through 6-in. pipe.





A G-E 150-hp 440-volt, 600-rpm synchronous motor drives each of the three 930-cfm Ingersoll-Rand compressors. Motors and compressors run 24 hours a day, five days a week.



G-E control for each motor consists of a semi-magnetic starter providing reduced-voltage starting and complete motor protection. G-E motor-generator sets supplying field current are controlled by G-E magnetic starters mounted above them.

AIR for BOTH TUNNELER AND TRAVELER ... *Electrically*

G-E motors and control drive compressors for construction equipment and permanent ventilating blowers at San Francisco's Broadway Tunnel

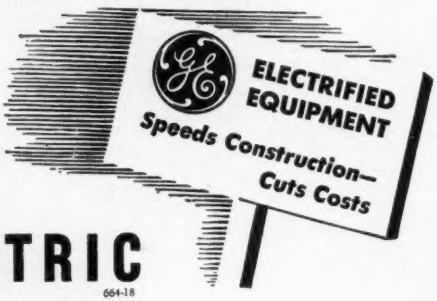
Compressed air to operate the more than 100 tools, hoists, and muckers being used by the Morrison-Knudsen Construction Co. in work on San Francisco's Broadway tunnel is supplied by centrally located compressors driven by G-E motors and control. Used in place of numerous individual units, the central air supply cuts maintenance costs and adds flexibility to the tunneling operation.

Expressing complete satisfaction with the system, Assistant Project Manager Harry Kirmond reports outstanding performance from G-E drives: *no unscheduled downtime has been charged to the drives up to the halfway mark in the two-year project.* And when the tunnel is complete, G-E equipment will still be on the job in the form of ventilating-equipment drives, and complete distribution facilities for lighting.

This is another excellent example of the flexibility, speed, and economy that G-E electrification can give you on construction jobs. *General Electric Company, Schenectady 5, N. Y.*

Ask him Today!

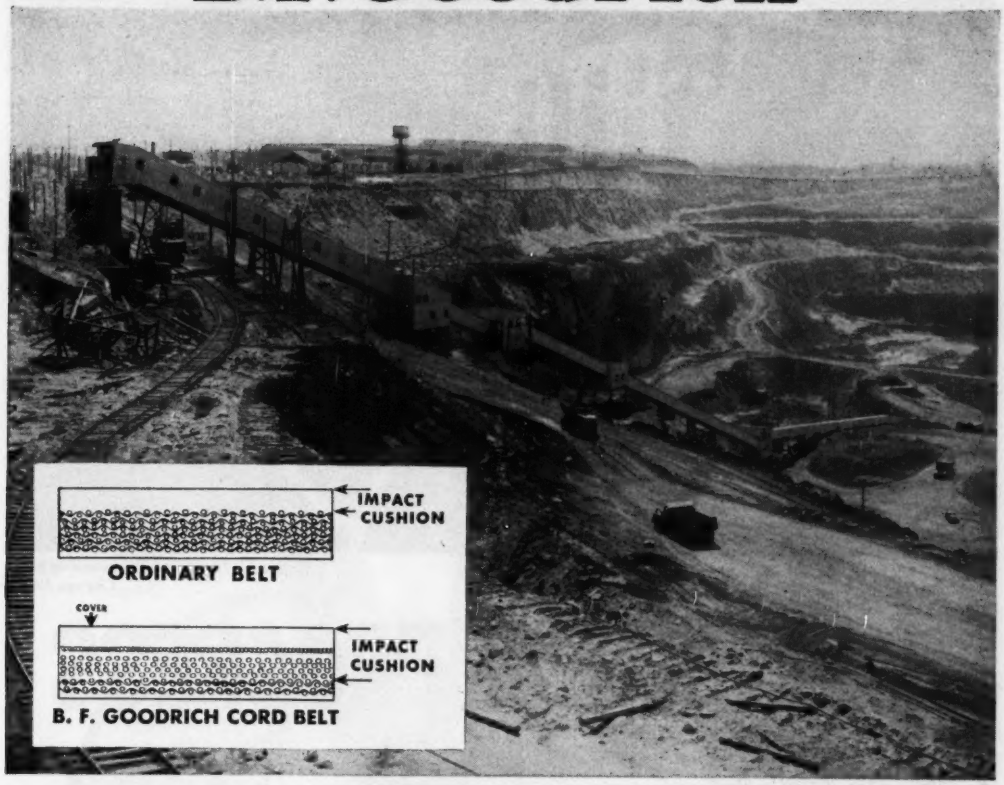
Whether you buy or build construction equipment, your G-E representative can show you how to do a better job—at lower cost—by complete electrification. Write him now, and he'll call on you at your convenience.



GENERAL ELECTRIC

664-18

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



Cord belt for tough jobs, longer centers, higher lifts

Gives 2 to 6 times greater impact resistance

WHERE you have heavy impact, long centers, high lifts, there's a special belt for your installation — the B. F. Goodrich cord conveyor belt:

Cord belt stands more impact — Each lengthwise cord in a B. F. Goodrich cord belt is completely surrounded by rubber — no cross threads tie them together. Cords are free to "give" when impact occurs. Rubber distorts temporarily, distributing and absorbing a shock that would damage stiff, unyielding plies. As an extra protection, B. F. Goodrich has added a patented *Transcord Breaker* — an extra layer of parallel cords in rubber, placed across belt width. Acts as a shock absorber, stretches to prevent gouges and cuts from splitting belt cover.

Cord belt troughs better — There being no crossweave in the cord plies, cords are free to flex. Belt conforms to idlers, pulleys. Spillage is reduced, troughing is natural and belt keeps centered on idlers, sustains less damage, requires less maintenance. Longer centers, higher lifts can be used.

Cord belt at work — Inside the housing shown here, a 3,000 ft. B. F. Goodrich beltroad handles iron ore in one of the largest mines on the Minnesota Iron Range. Installed in 1946, this belt has handled over 10 million tons. Estimated life is 10 more years and 30 million tons or more.

Cord belts for tough jobs—If your belts must take severe impact on loading, cutting and gouging at the loading chute, exposure to moisture and acid materials, heavy loads, you need B. F. Goodrich cord belts. Your BFG distributor will show you how they can save you money. *The B. F. Goodrich Co., Industrial & General Products Division, Akron, Ohio.*

Conveyor Belts BY
B.F.Goodrich
RUBBER FOR INDUSTRY

Cities Service Terminal & Compounding plant, Chicago, Illinois

Newest link of PROGRESS

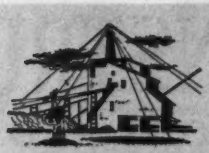
NOW!...The *newest...finest...* *most modern* plant for compounding and packaging lubricating oils

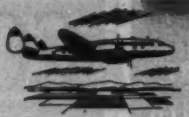
Month by month you see the proof piling up of still more Cities Service growth... strength . . . progressiveness. Now the latest Cities Service facilities have been added in Chicago's Cicero district. Here a completely modern 25-million-gallon plant is in full operation today, to serve you with lubricants of characteristic Cities Service quality.

The size of this complete plant...its rail and water transport advantages...and the excellence of its output signify the progress Cities Service is attaining throughout its marketing area. Cities Service has been progressive and will remain so, always striving to provide its dealers...its customers...with the finest petroleum products made.

CITIES SERVICE

For logging


For sand and gravel


For aircraft

For marine

For construction

For stone quarries

For elevators

For mining

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For industrial

For better service and more economy . . . use

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to order from assures the right rope for your equipment

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Ask for these helpful bulletins:

"Wire Rope—So What?" (No. 5134)—Illustrated exclusive interview with veteran wire rope engineer who talks straight from the shoulder about saving hundreds of wire rope dollars.

"How to Order Wire Rope" (No. 5025)—Tells exactly what to consider. Also includes convenient table of sizes, constructions, strengths and weights of Improved Plow Steel Wire Ropes.

Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles. Distributors throughout U. S. A. and other countries carry stocks.

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MORE foundations
AT LOWER COST WITH
SYMONS FORMS"

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3. Tightening Wedge.

Simple, sturdy hardware means fast erection and fast stripping. Without nails, forms last twice as long. Contractors report substantial savings in labor and material costs as well as important savings in time.

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CONSTRUCTION METHODS AND EQUIPMENT

Volume 33, Number 11 **NOVEMBER 1951** Established 1919

Pay Dirt in This Issue

Steam Crane Grows Smaller, Becomes Good Piledriver 42
Efficient unit built from old, outsize machine also is compressed into smaller package for easier handling

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World's Most Powerful Dredge Built for Dam Job 54
Sporting 11,000 hp and costing some $1½ million, it digs chalk rock from the Missouri River at Ft. Randall

How to Use Steam Cleaning Equipment Effectively 63
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Member ABC and ABP

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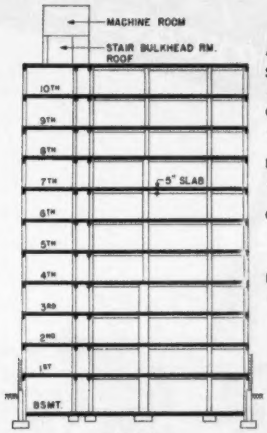
5 Key Advantages

EXPLAIN SWING TO REINFORCED-CONCRETE FRAME CONSTRUCTION



SECTION A-A

JOB DATA

Average Typical Floor

Superficial floor area
.....7,100 sq. ft.

Contact form area
.....11,000 sq. ft.
(1.55 sq. ft. per sq. ft. area)

Reinforcing steel
.....34,600 lb.
(4.9 lb. per sq. ft.)

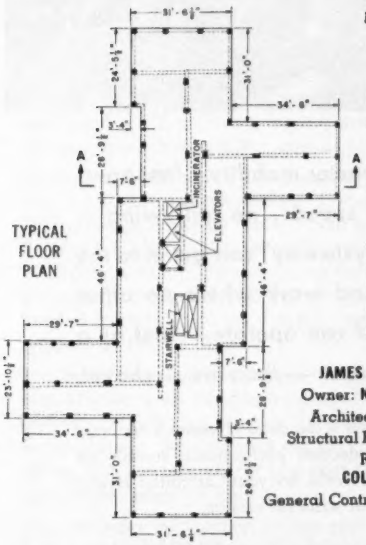
Concrete
.....160 cu. yd.
(averaging 7.3 in. thickness per s.f. ft.)

Rub and patch area
.....6,900 sq. ft.

James A. Bland Houses—Concreted with 'Incor' 24-Hour Cement —Another Example of Progress in Design and Concreting Methods

● This New York City Housing Authority project in Flushing, N.Y., again demonstrates that multi-story concrete frames, with their inherent fire-safety, are being erected at less cost than traditional types, at equal or greater speed—with these results:

1. Typical column, beam and slab arrangement, with all beams over partitions, columns generally of same dimensions from floor to roof—saves on form-work and in placing reinforcing steel;
2. No beams in rooms—reduced story height without reducing cubage;
3. Reduced height of partitions and overall exterior masonry walls—shorter vertical utility runs;
4. Columns placed off line in either direction—greater freedom for architect;
5. Forming floor slabs with plywood—eliminates need for plastered ceilings.



An Assist from 'Incor' 24-Hour Cement

Designed for concrete, the Contractor lays out the job for assembly-line speed, making fullest use of dependable 'Incor' high early strength: Minimum heat protection in cold and cool weather; stripping schedules quickly regained after rain or other delay—maximum erection speed with minimum form investment. On James A. Bland Houses, CORBETTA CONSTRUCTION CO., INC., concreted 55 floors in 100 working days, with five form-sets—one set for each 10-story building.

Plan apartments, schools, hospitals, hotels, industrial buildings with 'Incor'* concrete frames, for fire-safety and stability, lower first-cost, less maintenance. *Reg. U. S. Pat. Off.

JAMES A. BLAND HOUSES, Flushing, N. Y.
Owner: **NEW YORK CITY HOUSING AUTHORITY**
Architects: **CHAPMAN, EVANS & DELEHANTY**
Structural Engineers: **SEELYE, STEVENSON & VALUE**
Ready-Mix 'Incor' Concrete:
COLONIAL SAND & STONE CO., INC.
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'INCOR' HIGH EARLY STRENGTH PORTLAND CEMENT
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LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

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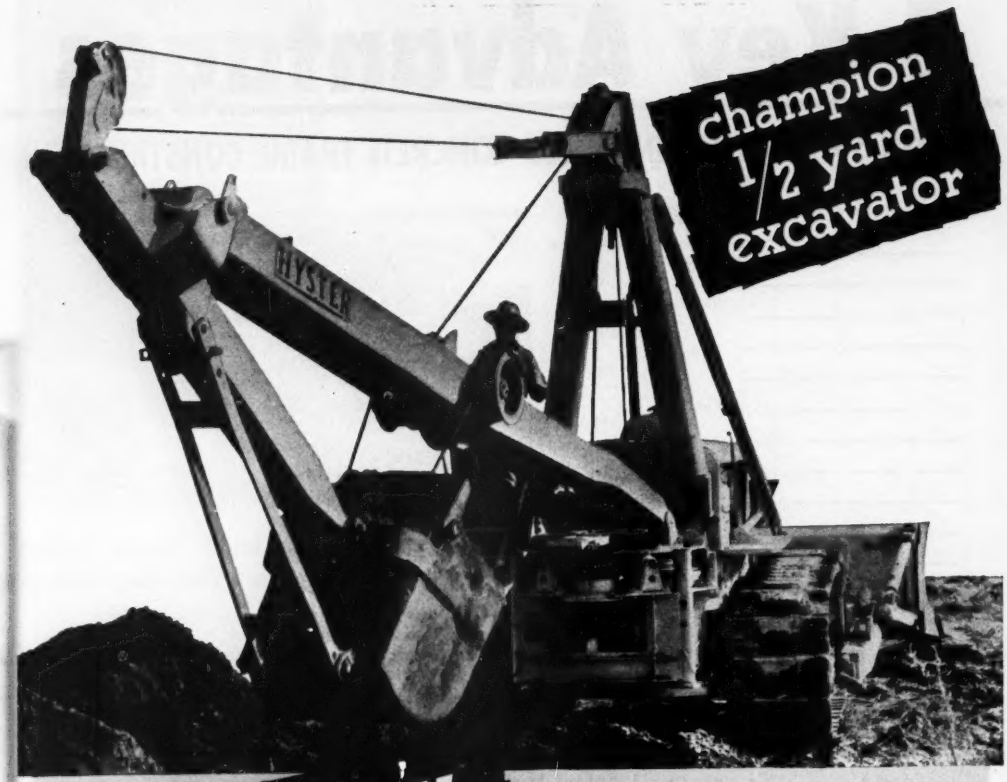
LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 17 MODERN MILLS, 125,000,000 SACKS ANNUAL CAPACITY



champion 1/2 yard excavator

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...for mounting on New or Used Caterpillar D8, D7, and 74 in. gauge D6 Track-type Tractors

Depending on job requirements, the Hystaway can be used as a BACKHOE, SHOVEL, DRAGLINE, CLAMSHELL OR CRANE. Mounting on tractor can be done in an hour (2 men); removed in ½ hour after initial installation ...Full production bulldozing or normal tractor operations can then be accomplished.

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There is a Euclid model for every off-the-highway hauling requirement. Rear Dump "Eucs" of 10 to 34 ton capacity have travel speeds up to 36.3 m.p.h. and are powered by diesel engines of 125 to 400 h.p. Bottom-Dump Euclids range in capacity from 13 to 25 cu. yds., have top loaded speeds up to 34.4 m.p.h., and diesel engines of 190 to 300 h.p.

The Euclid Scraper has proved its dependability and efficiency on the construction of roads, levees, airports and in open pit mining. The Euclid Loader, teamed with the Euclid Bottom-Dump, has set records for low cost earth moving on a wide range of jobs.

You get more production at less cost with Euclids. Call your Euclid Distributor for help with your off-the-highway hauling problems, or write for information on the complete line of Euclid equipment.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

CABLE ADDRESS: YUKLID — CODE: BENTLEY

EUCLIDS *Move the World*

B.F.Goodrich

This tire has a built-in rock-absorber

LAMBERT BROS., INC., of Knoxville, Tennessee, are engaged in quarrying operations in Tennessee, North Carolina, Georgia and Virginia. Trucks used in their operation travel in and out of the quarries, carrying heavy loads of dynamited limestone to the crusher. Pictured is one of the dump trucks at the Shepherd, Tennessee branch of the company (above), equipped with B. F. Goodrich Universal tires. Through the use of these tires the company says that better traction is obtained and that they hold as well in one direction as in the other. And the special construction provides unusual bruise resistance when travelling over rocks.

BFG Universals are ideal for toughest off-the-road service. They turn in top performance records even where rock, shale, stumps, ruts and other hazards are tire threats. Wedge-shaped tread resists cuts. Sidewalls are reinforced with tough, extra-thick rubber. The backbone, or body, of the tire is protected by the patented *nylon shock shield*. It acts as a shock-absorber—or "rock-absorber". And *here's* where you get extra bruise resistance. Strong, live, elastic nylon cords are built in between the tread rubber and the cord body. Under impacts of any kind, these cords work together, absorbing and distributing the shocks.

This feature is found in all BFG tires of 8 or more plies at *no extra cost*. *Double* nylon shock shield is used in Universals of sizes 11.00 and larger.

B. F. Goodrich tires are built for *every* type of on or off-the-road operation. No matter what your specifications may be, you'll find that your local B. F. Goodrich dealer can show you the way to longer and better tire service. *The B. F. Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS
B.F.Goodrich
FIRST IN RUBBER

THE BOOM Doesn't Make The Machine
TOO often equipment buyers buy convertibility with only a change of booms in mind.
The Boom doesn't make the Machine! Real Convertibility — the things that make a machine a leader whether operating as a Shovel, as a Crane, as a Dragline, or as a Pullshovel, comes from the combination of design, materials, balance, engineering— all the tangible and intangible qualities that result from years of experience.
Real Convertibility is a combination of Basic Machine and Attachments!
The original Northwest was built as a convertible unit and Northwest has so combined design and materials to give superior performance and higher output in each class of service — Shovel, Crane, Dragline or Pullshovel.
Convertibility is important. You can have it at its best. Why not place an order for a Northwest? Plan ahead and follow the Northwest Crowd.
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NORTHWEST
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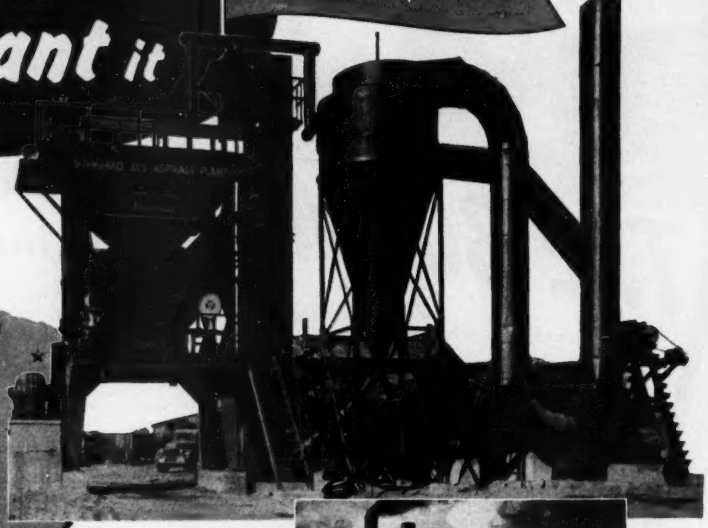
VEIGH ALL THE ADVANTAGES

To see it is to want it

STANDARD

Stars indicate locations of new Standard plants

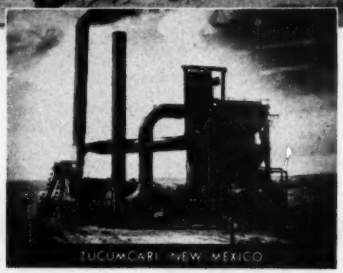


...that's why

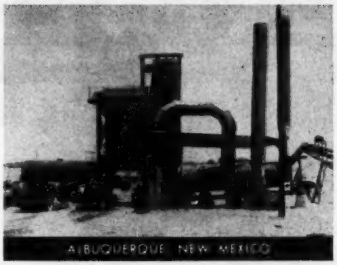
9 operators in a single Texas-New Mexico area all chose STANDARD within 6 months

The first of the Texas-New Mexico installations of the new STANDARD SM SERIES ASPHALT PLANT was in February, 1951, at Albuquerque, New Mexico. News travels fast in the great Southwest. Operators from the surrounding territory came, saw, and were convinced. In less than 6 months eight more STANDARD PLANTS had been purchased in the same area.

The reason is performance. To see the new STANDARD PLANT in action is to immediately appreciate what a big factor it is in reducing paving costs. It is the contractor's plant – less down-time, greater capacity, and smoother operation. Again STANDARD proves why STANDARD PLANTS have been preferred all over America for more than 30 years.



TUCUMCARI, NEW MEXICO



ALBUQUERQUE, NEW MEXICO

AMERICA'S MOST MODERN ASPHALT PLANT

Look at those advanced features

• Roller bearing equipped, twin-shaft mixer with patented sectionalized lining for easier, more economical replacement • Vertical hot elevator to cut friction and vibration • Fully dust sealed throughout • New easy motion control levers at operator's station to reduce fatigue factor • Individual electric motor drives • Manual or fully automatic weighing • Pressurized oil heating system • All parts easily accessible • Clean, straight line design for elimination of vibration • Completely synchronized flow • Unit built for easy erection, dismantling and transportation.

8 SIZES – 500 TO 6000 POUND BATCH CAPACITIES

STANDARD

SM SERIES

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Manufactured by

STANDARD STEEL CORPORATION

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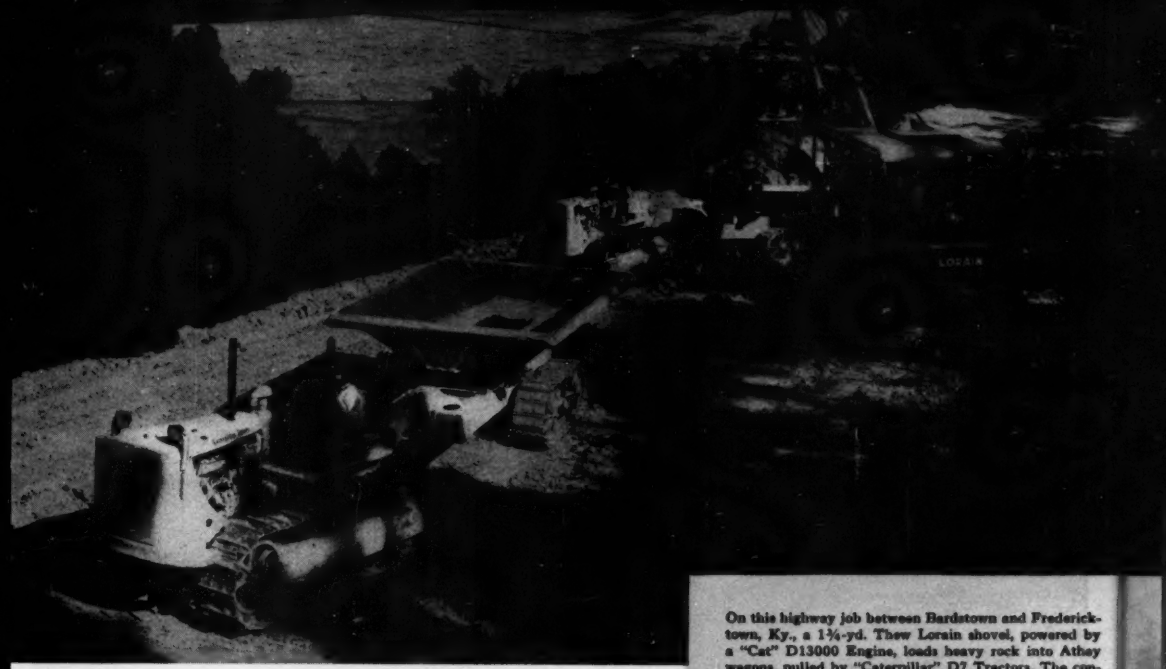


On this highway job between Bardstown and Fredericktown, Ky., a 1¼-yd. Thew Lorain shovel, powered by a "Cat" D13000 Engine, loads heavy rock into Athey wagons, pulled by "Caterpillar" D7 Tractors. The contractor is W. C. Snyder, Danville, Ky.

There's a big job ahead

How your equipment stands up in the months ahead has a real bearing on America's fight to be strong and stay free. A vital part of that effort is the $12,000,000,000 worth of earthmoving and road building needed this year. And we're entering a period that will separate "the men from the boys" in the field of construction machinery.

Military needs and Defense Rated Orders are taking their share of "Caterpillar" production. Shortages of steel and other materials add to the difficulty of supplying the demand for new machines. This means that *present equipment must be kept in use.*

"Cat" Diesel Engines, Tractors, Motor Graders and Earthmoving Equipment are built with the stamina to serve you long and faithfully. But *how* long is up to you and the operation and maintenance you give them. Good care pays off.

You can add many hours to equipment life if you follow sound maintenance practices. Anticipate your parts needs *before* wear goes beyond repair. Talk it over with your "Caterpillar" dealer. He is qualified to give competent opinion. If a part is not readily available, he has the tools and knowledge to rebuild many worn parts — and keep your machinery on the job.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

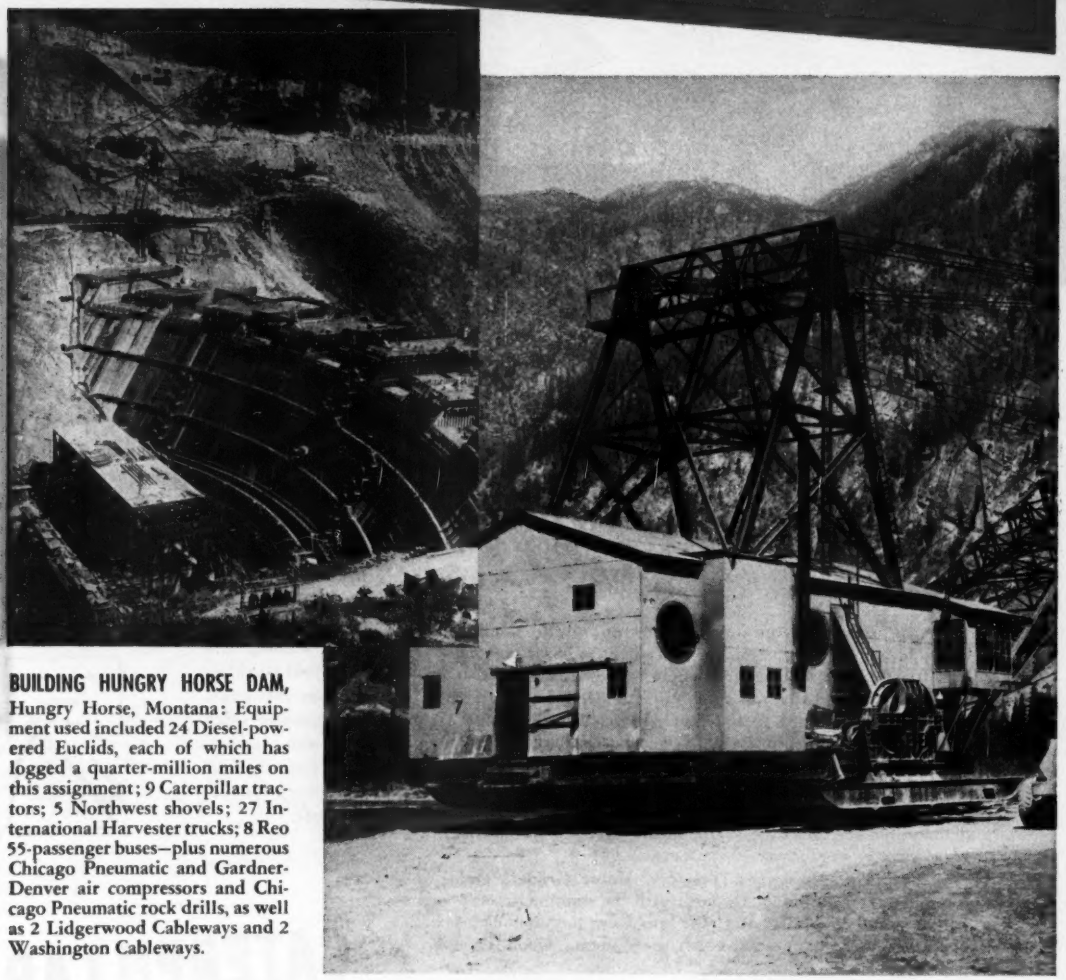
You're the Doctor

Don't let your engine overheat. Maintain the cooling system, keeping it free of scale, rust and sediment. Use soft or treated water and, when freezing temperatures exist, protect your engine with anti-freeze. Clean the radiator periodically, removing foreign matter from the core by brushing or washing. Use chemical flushing solutions. Prevent engine troubles which come with overheating. Consult your Operator's Instruction Book.

CATERPILLAR
REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

"AT HUNGRY HORSE ONLY HANDLED ALL OUR



BUILDING HUNGRY HORSE DAM,
Hungry Horse, Montana: Equipment used included 24 Diesel-powered Euclids, each of which has logged a quarter-million miles on this assignment; 9 Caterpillar tractors; 5 Northwest shovels; 27 International Harvester trucks; 8 Reo 55-passenger buses—plus numerous Chicago Pneumatic and Gardner-Denver air compressors and Chicago Pneumatic rock drills, as well as 2 Lidgerwood Cableways and 2 Washington Cableways.

TUNE IN . . .
TEXACO STAR THEATER
starring
MILTON BERLE
on television
every Tuesday night.
See newspaper for
time and station.

TEXACO

TEXACO

6 TEXACO PRODUCTS MAJOR LUBRICATION"

General-Shea-Morrison Company, Contractor, Hungry Horse Dam, Hungry Horse, Montana, says—

"The time and confusion saved by the Texaco Simplified Lubrication Plan are incalculable."

"Not only is it more economical to use a small number of lubricants," says General-Shea-Morrison Company, "but there is little chance of error in application. The Texaco Lubricants used at Hungry Horse Dam were a big factor in keeping our equipment on the job and our maintenance costs low."

Products Used in Texaco Simplified Lubrication Plan

1. Engine Lubrication: Use *Texaco Ursa Oil X***. This fully detergent-dispersive oil keeps both heavy-duty gasoline and Diesel engines clean . . . keeps harmful deposits from forming . . . guards against wear, rust and bearing corrosion. Maintenance costs and fuel consumption are both lower.

2. Chassis Lubrication: Use *Texaco Marfak*. It's tough, longer lasting. Won't jar or squeeze out of bearings, protects against dirt, rust, wear. *More than 400 million pounds of Texaco Marfak have been sold!*

3. Wheel Bearing Lubrication: Use *Texaco Marfak Heavy Duty*. It seals out dirt and moisture, seals itself in — assuring longer bearing life, safer braking. No seasonal change required.

4. Crawler Track Lubrication: Use *Texaco Track Roll Lubricant*. It gives long-lasting protection against dirt, water and wear. Reduces maintenance costs.

5. Air Compressor Lubrication: Use recommended Texaco air compressor oils. There is one exactly suited to your particular operating conditions.

6. Rock Drill Lubrication: Use *Texaco Rock Drill Lubricant EP*. It has "extreme pressure" properties that give superior protection against wear. It guards against rust whether drills are running or idle.

Follow the Texaco Simplified Lubrication Plan for greater savings and convenience on every job. A Texaco Lubrication Engineer will gladly help you set it up to meet your particular conditions. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

3 New Ways to Cut Costs with Le Roi TRACTAIR

(Tractor-Compressor)

Tractair with its combination tractor-105 compressor feature and its many attachments has provided money-saving usefulness for contractors, utilities, and municipalities everywhere. Here are 3 new attachments that have already proved their ability to reduce costs:

1 Tractair Backhoe saves on small digging jobs

It gives you air power for breaking through pavement, frost, or running other air tools. Then the hydraulic backhoe takes over — does your digging fast and easy to a depth of 8 feet. Plenty of power for roots, broken concrete or hard ground. Digs straight end walls and loads to a height of 6'2".

2 Tractair Patch-Drill saves on pavement patching and trench opening

This unit consists of an air-feed Le Roi-CLEVELAND H-10 sinker (45 lb). It permits easy, fast drilling of a succession of holes. Then, using the same machine, all you have to do is broach out the web between the holes and lift out the entire section of pavement. There is no loading problem — no shoveling. Holes can be drilled and broached in an 8' radius. Tractair supplies air power, mobility, and, when equipped with front-end loader attachment, lifting power, too.

3 Tractair Multiple Tamper saves on tamping operations

Thanks to Tractair mobility, the tamping effectiveness of the Le Roi-CLEVELAND 3-Tamper arrangement and work-saving air feed, this unit can keep up with three men shoveling or a back-filling tractor. Not only is tamping faster and easier, but you also get better compaction and lower costs.

Learn more about the money-saving usefulness of Tractair for your own type of work. Send today for the 70-page, information-packed Tractair application book.

Tear out this coupon and mail TODAY!

LE ROI COMPANY
Dept. CM-11, 1768 So. 68th Street, Milwaukee 14, Wisconsin

I want to know more about Tractair's ability to cut costs. Please send me your new 70-page Tractair Application Book.

Name..... Title.....

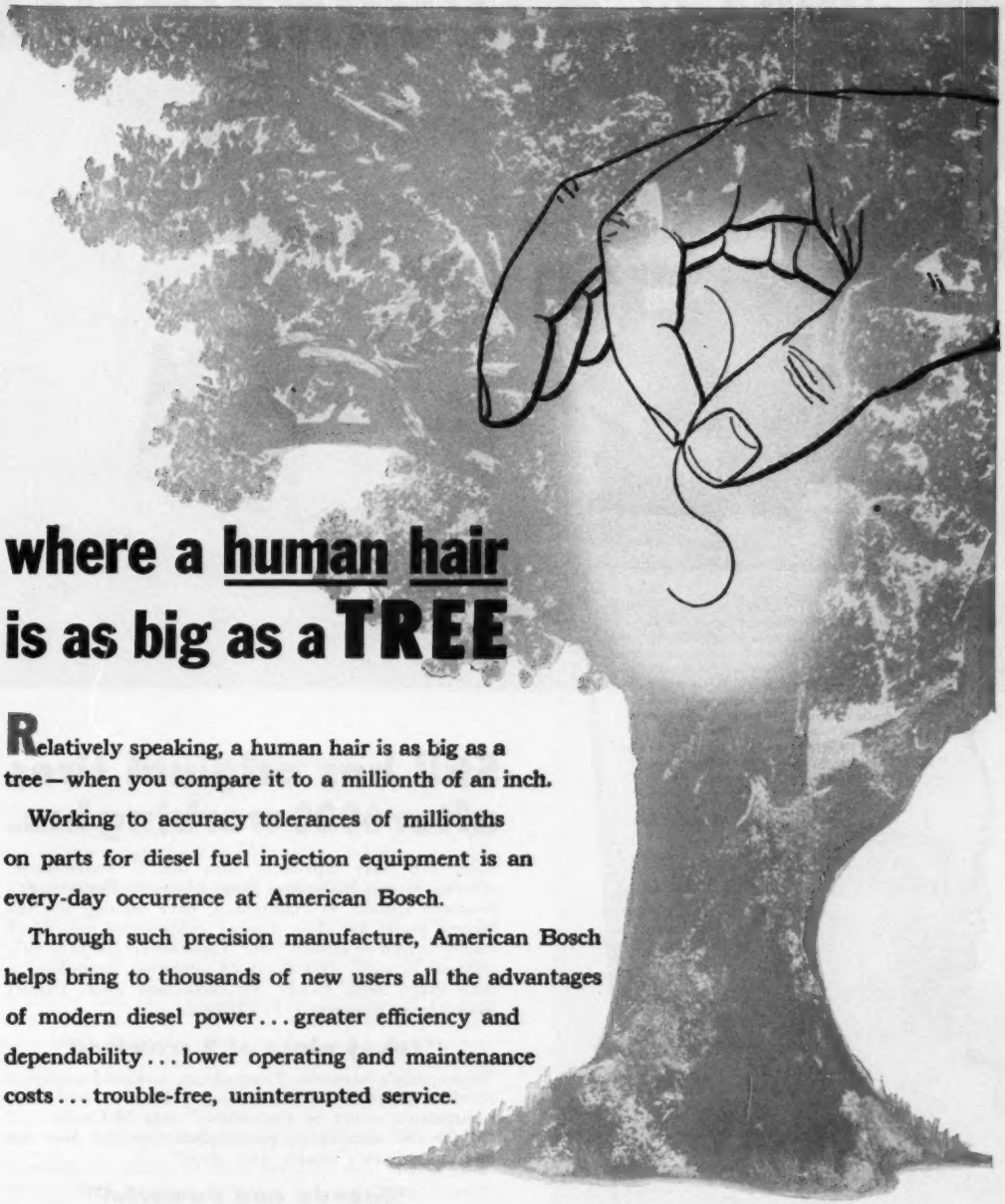
Company.....

Address.....

City..... (.....) State.....

T-10

LE ROI COMPANY
MILWAUKEE 14, WISCONSIN
Plants: Milwaukee • Cleveland • Greenwich, Ohio



where a human hair is as big as a TREE

Relatively speaking, a human hair is as big as a tree—when you compare it to a millionth of an inch.

Working to accuracy tolerances of millionths on parts for diesel fuel injection equipment is an every-day occurrence at American Bosch.

Through such precision manufacture, American Bosch helps bring to thousands of new users all the advantages of modern diesel power... greater efficiency and dependability... lower operating and maintenance costs... trouble-free, uninterrupted service.

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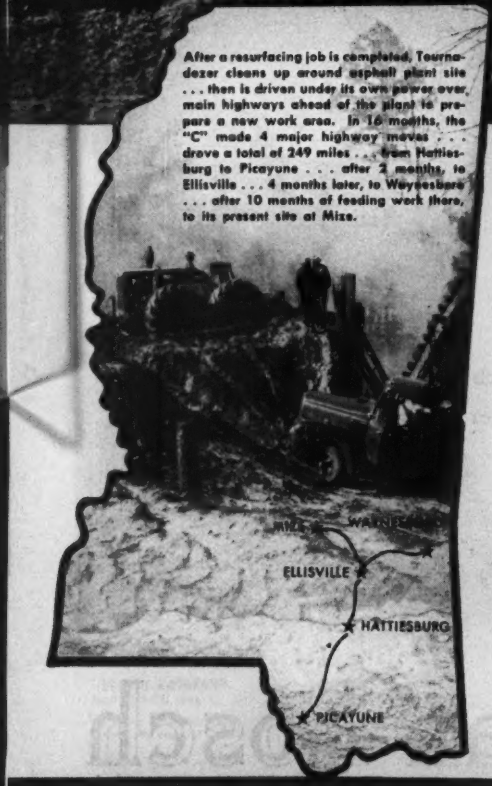
AMERICAN BOSCH CORPORATION • SPRINGFIELD 7, MASS.

In 3½ years of operation

TOURNADOZER

After a resurfacing job is completed, Tournadozer cleans up around asphalt plant site . . . then is driven under its own power over main highways ahead of the plant to prepare a new work area. In 16 months, the "C" made 4 major highway moves . . . drove a total of 249 miles . . . from Hattiesburg to Picayune . . . after 2 months, to Ellisville . . . 4 months later, to Waynesboro . . . after 10 months of feeding work there, to its present site at Mize.



Still has original tires after 6000 working hrs.

After 3½ years experience with this C Tournadozer, officials of the Mississippi State Highway Department's Southern District at Hattiesburg, have nothing but the highest praise for their veteran rubber-tired rig. Used mainly to feed an asphalt plant, Tournadozer has been 90% efficient in over 6000 hours of operation, according to both Plant Supt. Grady McCardle and Asst. District Maintenance Engineer J. F. Calhoun.

"Takes place of 2 crawlers"

"If we didn't have the Tournadozer, it would require 2 crawlers to assure maximum plant production, and track maintenance would be prohibitive," says McCardle . . . *"We're still running on our original tires and have not had one minute's trouble with them!"*

"Speedy and Powerful"

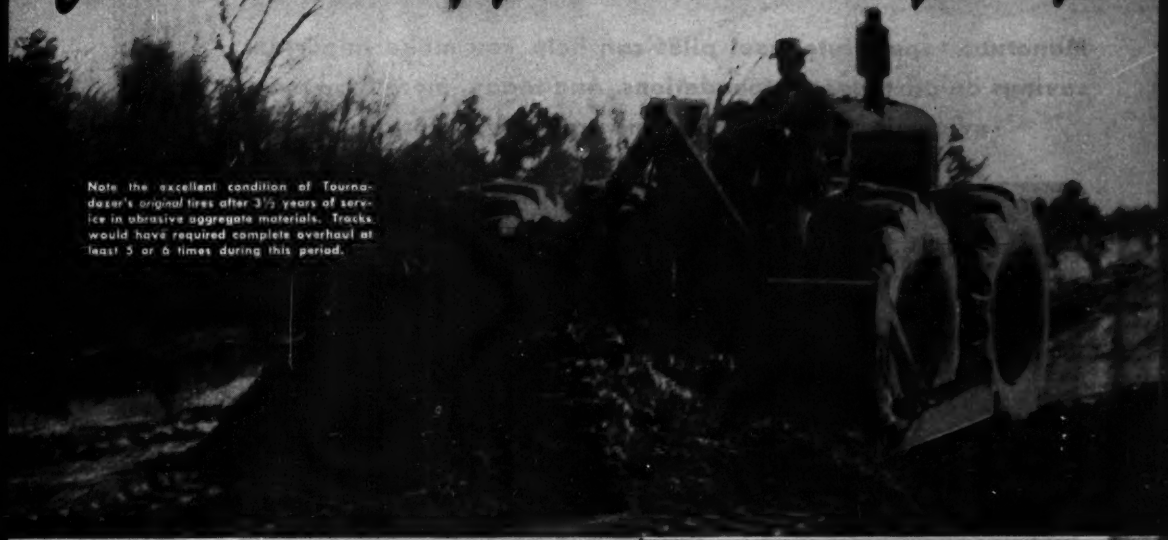
"Tournadozer is the only tool we've found that can keep our plant supplied," adds Calhoun. "We could not operate successfully without it. The machine gives us both speed and power when we need it."

R. G. LeTOURNEAU, INC.,

PEORIA, ILLINOIS

delivers 90% efficiency

for Mississippi State Hwy. Dept.



Note the excellent condition of Tournadozer's *original* tires after 3½ years of service in abrasive aggregate materials. Tracks would have required complete overhaul at least 5 or 6 times during this period.

"Easy to operate"

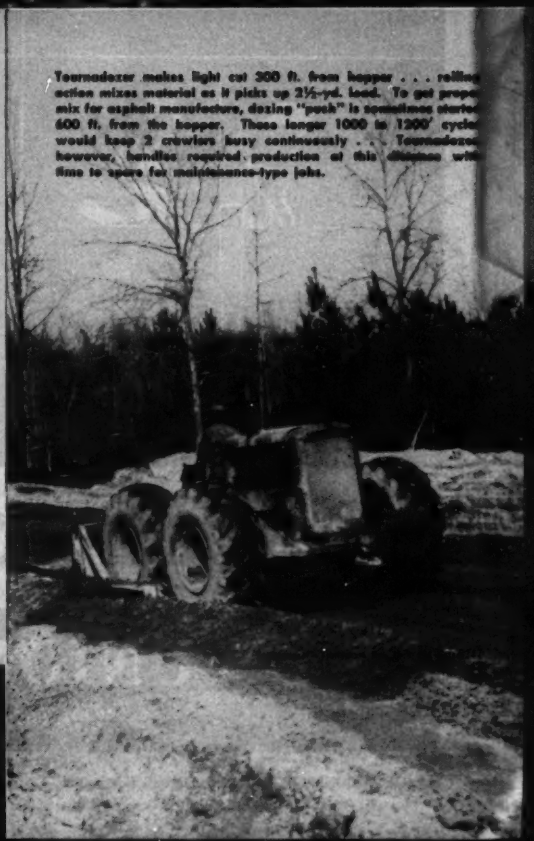
"It's the easiest machine I've ever operated," concludes Operator J. E. Chandly, a veteran of 8 years of experience on construction equipment. "Compared to a crawler, it's like driving a new car alongside an old truck."

Here's typical production:

As required, Tournadozer moves clayey sand and fine gravel from pit to hopper, easily delivering enough material to produce up to 770 tons of asphalt per 9-hour day. Despite heavy hopper requirements and long dozing cycles of 600 to 1200 ft., Tournadozer usually handles feeding assignments in 50 to 70% of its working time . . . uses spare hours to maintain haul roads and handle a variety of other dozing tasks. Last year, with the "C" handling 100% of the feeding work, plus these other jobs, the plant produced between 80 and 85,000 tons of asphalt.

Try one on your job

Tournadozer's ability to work day after day, month after month, with a minimum downtime for weather and repairs . . . plus its ability to double or triple crawler production under most conditions . . . can mean very important savings for you, too. Ask your LeTourneau Distributor for a complete picture of the production increases possible on *your* work with new, rubber-tired 19 m.p.h. Tournadozers.



Tournadozer makes light cut 300 ft. from hopper . . . rolling action mixes material as it picks up 2½-yd. load. To get proper mix for asphalt manufacture, dozing "puck" is sometimes started 600 ft. from the hopper. These longer 1000 to 1200' cycles would keep 2 crawlers busy continuously . . . Tournadozer, however, handles required production at this distance with time to spare for maintenance-type jobs.

HIGH-SPEED, RUBBER-TIRED EXCAVATING

HAULING • LIFTING EQUIPMENT

R. G. LeTOURNEAU, INC. LET EQUIPMENT

MONOTUBE

Monotube taper-flute steel piles can help you make important savings on all types of foundations. And today, more than ever, savings in materials and time are *doubly* important.

1. SAVES WORK!

because Monotube's light weight makes handling and locating easier, faster!

2. SAVES MATERIALS!

because of proven excellence in transmitting loads to the penetrated soil, plus the assurance of their condition after installation. Monotubes can be designed for heavy loads. Result: fewer piles may do your job.

3. SAVES TIME!

because Monotubes are readily extendible on the job, with easy cut-off and simplified weld splicing.

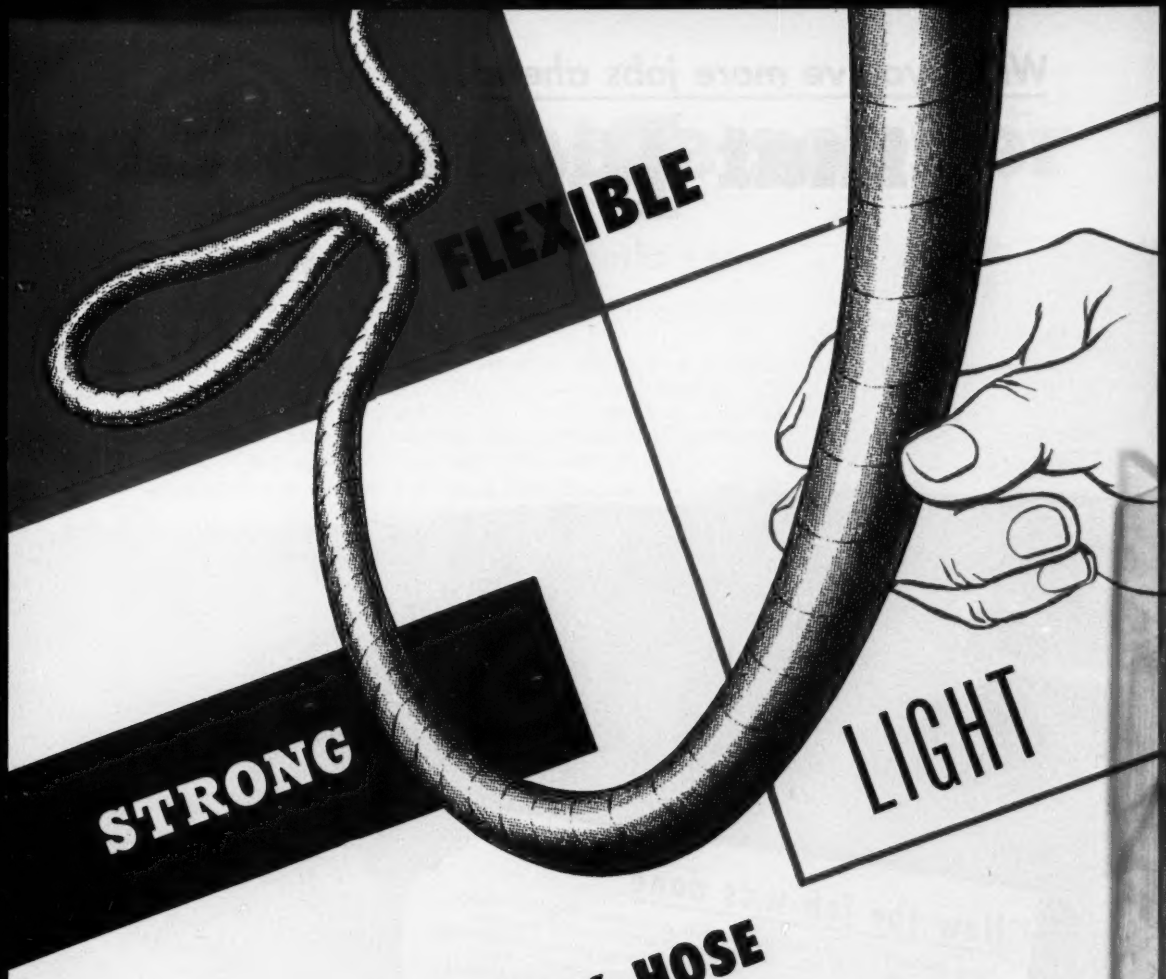
4. SAVES WORRIES!

because tubular design permits rapid, sure inspection before concreting.

Get all the facts about Monotubes' advantages. For complete information, write The Union Metal Manufacturing Company, Canton 5, Ohio.

UNION METAL

Monotube Foundation Piles



Condor HOMOFLEX HOSE

"... Everything we want in a hose!" • That's how users sum up the many advantages of Homoflex Hose. • That's why they order more and more Homoflex once they discover it's really a *different* hose . . . easier to coil and uncoil . . . no kinking . . . easier to carry and drag . . . lasts longer in "rough going". • Bulletin 6879D tells why the unique construction of Condor Homoflex makes a better hose for handling air, water, other fluids and gases. • Extra qualities are also engineered into our other hose, V-belts, flat belting and conveyor belts. Just phone your R/M distributor.

RM

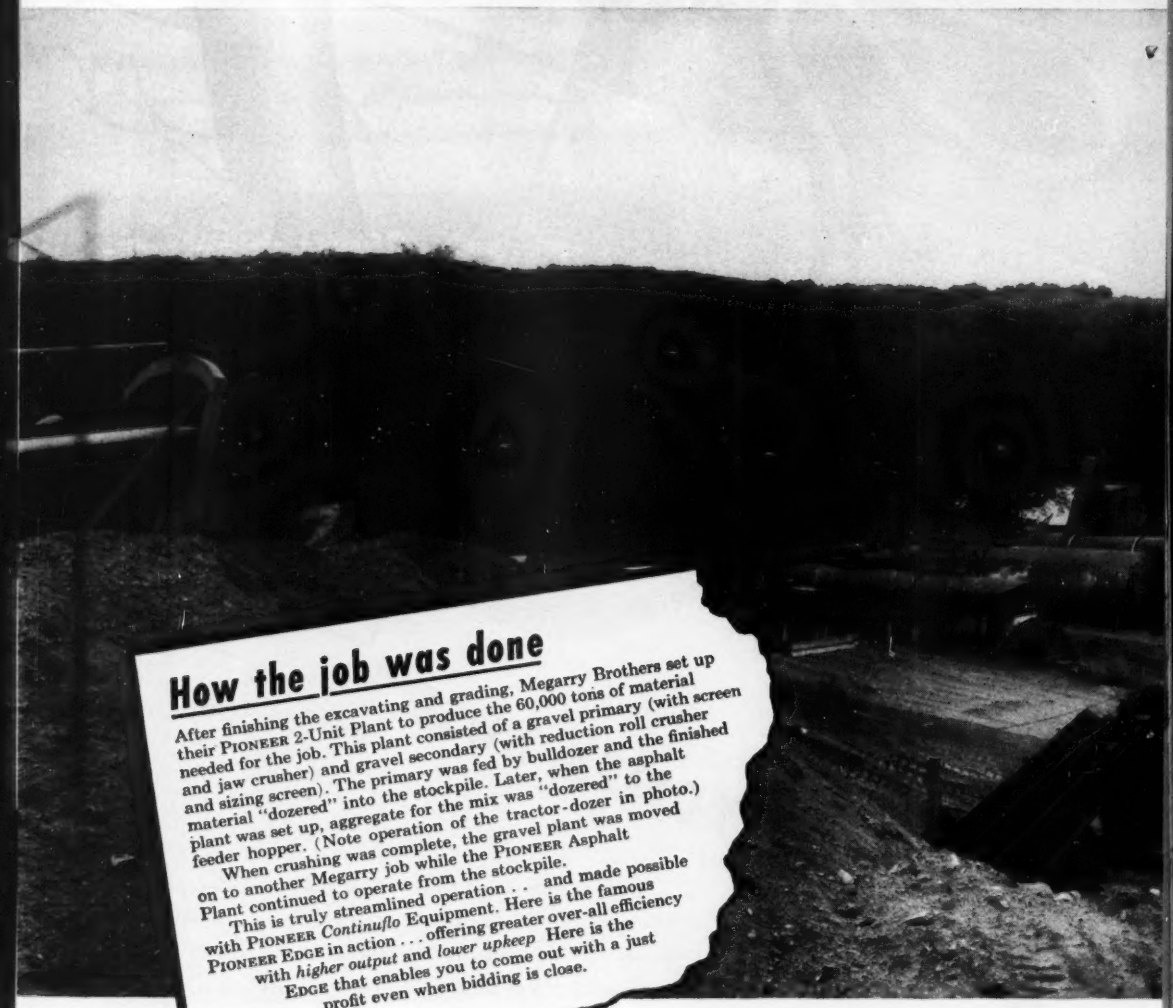
MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Manufacturers of Mechanical Rubber Products • Rubber Covered Equipment • Radiator Hose • Fan Belts • Brake Linings • Brake Blocks • Clutch Facings • Packings • Asbestos Textiles • Powdered Metal Products • Abrasive and Diamond Wheels • Bowling Balls

When you've more jobs ahead...

that Pioneer Edge



How the job was done

After finishing the excavating and grading, Megarry Brothers set up their PIONEER 2-Unit Plant to produce the 60,000 tons of material needed for the job. This plant consisted of a gravel primary (with screen and jaw crusher) and gravel secondary (with reduction roll crusher and sizing screen). The primary was fed by bulldozer and the finished material "dozered" into the stockpile. Later, when the asphalt plant was set up, aggregate for the mix was "dozered" to the feeder hopper. (Note operation of the tractor-dozer in photo.)

When crushing was complete, the gravel plant was moved on to another Megarry job while the PIONEER Asphalt Plant continued to operate from the stockpile.

This is truly streamlined operation . . and made possible with PIONEER *Continuflo* Equipment. Here is the famous PIONEER EDGE in action . . . offering greater over-all efficiency with *higher output* and *lower upkeep* Here is the EDGE that enables you to come out with a just profit even when bidding is close.

BUY BOTH!
HIGHER OUTPUT
LOWER UPKEEP

Pioneer

Continuflo EQUIPMENT

gets you there sooner

Megarry completes job 2 months early

Completing the job ahead of schedule is routine for Megarry Brothers of St. Cloud, Minnesota.

Take, for example, this $256,946.00 job on Minnesota State Highway 7 between Excelsior and Minneapolis. This 12.2 mile stretch called for 16,578 cubic feet of excavation and placing 35,171 tons of gravel base. The resulting 499,420 square yards of surface required 50,686 tons of bituminous mix. Finally, 2,136 tons of seal coat aggregate were placed on top.

Work began October 1950, and after a winter layover, was resumed the following April. The schedule called for completion September 1, 1951, but Megarry Brothers had the PIONEER EDGE on their side. Result: the job was finished in July, *two months early*. Again, the built-in ruggedness and extra capacity of PIONEER equipment had brought substantial savings to a wide-awake contractor.

Megarry Brothers choose Pioneer

● Megarry Brothers have found that dependable equipment is the key to efficient performance on a construction job. Here is some of the PIONEER equipment they own and operate.

1 Model 101 Portable Asphalt Plant consisting of a drier, dust collector, and combination gradation-mixing unit.
1 Auxiliary drier.
2 2-Unit Portable Plants each consisting of a 150 PG Primary and 140S Secondary.
2 40 V Duplex Portable Crushing Plants.
1 38 V Duplex Portable Crushing Plant.
1 30S W Washing Plant.

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(Subsidiary of Poor & Company • Chicago)

● Please send me information on the equipment checked.

☐ BITUMINOUS PLANTS	☐ ROLL CRUSHERS	☐ MECHANICAL FEEDERS
☐ GRAVEL PLANTS	☐ WASHING PLANTS	☐ VIBRATING SCREENS
☐ ROCK PLANTS	☐ APRON FEEDERS	☐ BUZZER SCREENS (LIGHT DUTY)
☐ JAW CRUSHERS	☐ ORO FEEDERS	☐ CONTINUFLO CONVEYORS

*Name*_____

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Let's go...let's get that SCRAP in!

All your SCRAP is urgently needed, NOW

THE scrap shortage is serious. *Your* scrap—every pound of iron and steel scrap you can locate in your plant or factory—is vitally needed and needed right away. For unless you do everything possible to get this scrap on its way to the mills, steel production is bound to slow up. That can't be allowed to happen. But without your help it surely will.

It takes at least one-half ton of scrap to make one ton of steel. With the mills turning out more than 2 million tons of steel per week, over 1400 carloads of industrial scrap are needed *every day*. And industry, somehow, must provide it.

What you can do to meet this emergency

First, organize a permanent Scrap Salvage Committee and make the "drive-for-scrap" part of your daily operations. Search out every possible source of scrap. Turn your old and worn-out equipment, tools and machinery over to your scrap dealer, at once. Dig out your discarded dies, rusted-out tanks and boilers, your old rails and other miscellaneous junk, and start them back to the mills through your scrap dealer. Encourage every employee to report every retired or obsolete machine that now stands idle—see that it is turned in for scrap.

By getting this "dormant" scrap off your premises and into the furnaces you'll be helping not only yourself but America as well. *More* scrap turned in, means *more* steel turned out—it's as simple as that. So let's get going.

You'll find your local scrap dealers listed in the yellow pages of the phone directory.

USS

1-1329

This page would ordinarily be used to tell you about

AMERICAN WELDED WIRE FABRIC

but, because without SCRAP we cannot produce steel, we are asking instead for your all-out help in getting more SCRAP to the mills.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

First in the Field and still the Best

*In self-propelled scrapers, Wooldridge was first to introduce positive hydraulic steering and air-operated power unit with fingertip remote controls—achieving new speed and ease of operation and eliminating jack-knifing hazards . . . first to set new higher production standards with such features as bolling bowl loading, positive plow-ejection, rear draft fulcrum leverage, and independent control of all scraper functions . . . first with air brakes, 24-volt electrical system, spring-loaded pusher button, massive oscillating king pin, to name a few of many engineering advances.

Since the first Terra Cobra revolutionized earthmoving practices through introduction of entirely new design principles, each year has brought new Wooldridge engineering improvements. Pioneering developments, the result of long specialized job study and experience, have been incorporated to bring greater owner satisfaction and lower hauling costs. That's why the new TC-S142 Terra Cobra is today the ruggedest, simplest, easiest to maintain, most productive machine in the field. Watch its faster loading and dumping, get the operator's story on its easy handling, compare its true pay load capacity, and check its low down time records. We think you'll rate the Terra Cobra best in the field—by far! Why not get all the facts today from your Wooldridge Distributor.

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model TC-S142

17.5 cu. yds. heaped

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BUILT FOR MORE PRODUCTION PER HOUR—MORE HOURS OF PRODUCTION

Exhaustive ENGINE TESTS Prove

ALL 5 CLRC TESTS, standardized by the Co-ordinating Lubricants Research Committee, prove Shell Rotella Oil superior to the average of leading diesel lubricants . . . from every critical standpoint: parts-wear, corrosion resistance, ring-sticking and piston fouling.

Moreover, further tests, such as the Modified Lauson Lacquer Rating Test and Shell's own extremely severe Four Ball Test . . . all add proof upon proof that Shell Rotella Oil *does* keep engines clean longer . . . *does* extend time between overhauls . . . *does* reduce parts wear.

FLEET SERVICE confirms engine test results!

Read these authorized reports:

Yellow Cab Company, Nashville, Tenn., has 75 cabs, running 24 hours daily. They write: "We have always had trouble with sludge forming in the crankcase of our motors due to the constant start and stop driving . . . On some cabs this sludge completely blocked the passage of oil through the pump screen . . . bearings were burned out.

"After months of operation on Shell Rotella Oil we are glad to report that the *motors (thus far) examined have been found entirely clean, the pump screen as bright as brand new, and we have had no bearing trouble of any nature.*"

Creston Transfer Company, Grand Rapids, Michigan, haul uncrated furniture to the East Coast and southern cities. Creston began using Shell Rotella Oil nearly 4 years ago to correct a serious overhaul problem due to short valve life in their trailer truck engines. Shell Rotella Oil has increased valve life from 8,000 miles to better than 40,000 miles and greatly reduced all-around maintenance costs. Creston Transfer is now expanding with hauls to nearly every state. The proved lower maintenance through using Shell Rotella Oil is a basic part of Creston's expansion planning.

SHELL ROTELLA OIL . . . EXTENDS

You can EXTEND TIME between overhauls...

SHELL ROTELLA OIL slashes maintenance costs—Maintains engine efficiency

1. Positive ANTI-ACID ACTION

Shell Rotella Oil drastically reduces wear in the vital top-cylinder zone by counteracting the acid action of unburned fuel particles. This protection is extremely important in engines with intermittent loading.

2. Constant DISPERSANT ACTION

The excellent dispersant properties of Shell Rotella Oil permit it to dissolve contaminants and hold them in suspension until draining time. This prevents premature fouling.

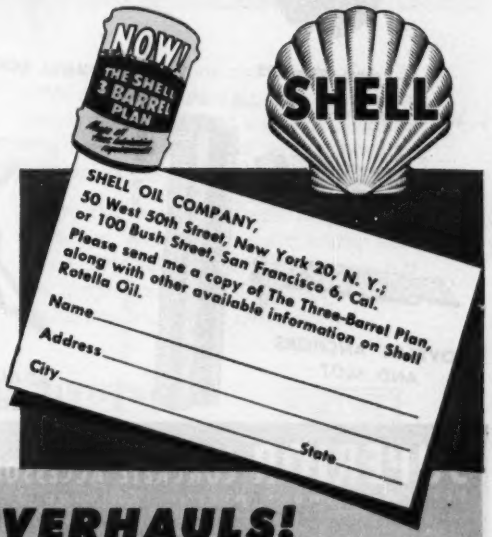
3. Maintained Engine Efficiency

Is the direct result of reduced top-cylinder and ring-face wear. Moreover, new or reconditioned engines operating with Shell Rotella Oil show a welcome extension of the "low oil consumption" period because of this same reduced wear. The above gains, combined with freedom from fouling and a significant increase in valve life, enable you to extend time between engine overhauls.

FLEET OPERATORS!

Shell Rotella Oil is "Barrel One" in Shell's famous Three-Barrel Plan for fleet lubrication

If you want to cut lubricant inventories to the bone . . . to realize savings in time, labor and materials . . . mail this coupon for "The Three-Barrel Plan." It's a practical booklet that shows how this revolutionary lubrication program can cut your maintenance costs.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THE SHELL 3 BARREL PLAN
SHELL
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or 100 Bush Street, San Francisco 6, Cal.
Please send me a copy of The Three-Barrel Plan, along with other available information on Shell Rotella Oil.
Name
Address
City
State

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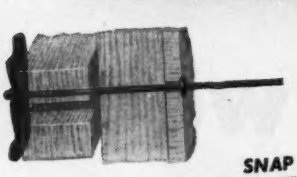
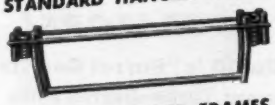
For Dependable Concrete Forming...

USE SUPERIOR CONCRETE ACCESSORIES



SNAP TIES

STANDARD HANGER FRAMES



SPECIAL HANGER FRAMES

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DOVETAIL ANCHORS AND SLOT

STANDARD COIL TIES

CONE-FAST COIL TIES

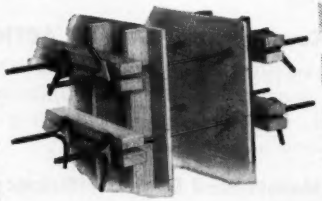
PANEL LOCK BOLTS

ADJUSTABLE SCREED CHAIRS

Here you see several of the many various types of Form Ties, Anchors and other concrete accessories which SUPERIOR'S many years of know-how and dependability have produced to meet rigid job specifications.

Every item in the SUPERIOR line is specifically designed to provide the most efficient forming method for ordinary foundations, engineering structures, watertight walls and architectural concrete.

When you plan form work, Superior's experienced engineers are always available to prepare suggested layouts of form work as well as complete estimates and quotations.



TILT LOCK CLAMPS

SUPERIOR CONCRETE ACCESSORIES, INC.
4110 Wrightwood Avenue, Chicago 39, Illinois

Request a copy of our new catalog . . . it contains a valuable table for spacing studs, wales, and form ties.

Loading stone from the quarry, this GM Diesel-powered 1½-yard Koehring handles 130 tons an hour on less than 4½ gallons of fuel.

20% HIGHER PRODUCTION at ⅓ the fuel cost

Cowan Stone Company, Cowan, Tennessee, wanted another make of Diesel when they bought their Koehring 605 shovel in 1948. But it was readily available with a GM Diesel engine, so they took it.

And when they recently converted a 21-year-old 1¼-yard shovel from gasoline to Diesel power, what engine do you think they installed? Another GM Diesel, of course!

With its smooth, steady flow of power, this veteran machine now stock-piles 125 yards an hour—approximately 20% more than it did before—and uses only 3 gallons of Diesel fuel per hour as compared to 7 gallons of gas.

Figure the savings in terms of your own operation. Then call in your nearby GM Diesel distributor. Ask him to show you how simple and economical it is to convert to this modern 2-cycle Diesel power.

ANSWER THE CALL CIVIL DEFENSE

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES... Up to 275 H.P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS... Up to 800 H.P.

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GM GENERAL MOTORS DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK

SERVICE HOURS

...*not Footage*

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When buying air hose, your thinking should not be in terms of footage-per-dollar but rather in terms of service hours.

Experience tells you that the hose which is built with an *extra* measure of strength, flexibility, damage resistance and safety is surely your soundest investment.

This is true of *every* BWH Air Hose. Each has been specifically developed, tested and field-proven to give maximum long, trouble-free life in its job.

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Warehouse Stock, 111 N. Canal St., Chicago, Ill.

CONCORD AIR — An extra quality, exceptionally rugged hose for toughest use on air drill and pneumatic service in mines, quarries and construction jobs. Non-porous tube resists heat and oil. High tensile cotton yarn braid reinforced carcass. Tough grey cover resists cutting, gouging, abrasion. 7 sizes from ½" 2-braid through 2" 3-braid. 200 to 300 lbs. working pressure. Maximum length 50'.

BAY STATE AIR DRILL — For heavy construction work in mines, quarries, tunnels and wherever large size hose is required for long service. Smooth black tube resists heat and oil. Carcass of strong, rubber-impregnated multiple ply woven duck. Rugged, heavy-gauge red rubber cover resists severe weather extremes, cutting, abrasion. 9 sizes stocked from ½" to 4". Working pressures from 150 to 225 lbs. Max. length 50'.

AUROCHS AIR — For portable air compressors, jackhammers, rugged industrial and construction work. Smooth, black, non-porous tube resists heat and oil. Carcass: multiple ply, rubber-impregnated, rugged woven fabric. Tough black cover resists weather and abrasion. Stocked sizes: ½", ¾", 1". 200 lbs. working pressure. Maximum length 50'.

VIM AIR — For general industrial use, on compressors and pneumatic tools. Black tube resists oil and heat. Husky cotton yarn braids. Smooth, red cover resists weather, abrasion. 8 sizes stocked, ¼" 2-braid to 1" 3-braid. Working pressures: 150 to 225 lbs. Maximum length 500'.

BULL DOG VARI-PURPOSE AIR — For a variety of jobs including handling of air, water, oil, gasoline, kerosene (not for paints, lacquers, lacquer-solvents). Black, synthetic tube resists oil and heat. Carcass is braided rayon cord, high strength, super flexible. Smooth, brown, tough synthetic cover resists oil, abrasion, sunlight. 11 sizes stocked from 3/16" one-braid to 1" 2-braid. Working pressures: 200 to 300 lbs. Maximum length approximately 500'.

Like Thanksgiving Day and Turkey . . .

they Go Together

Sure-footed as a mule . . . the A-W Power Grader

Ride it down with the grader . . . that's the way to slope a bank! Keep the blade down under the frame where it belongs . . . where it will run smooth and true.

You can do it with an Austin-Western Power Grader, thanks to exclusive All-Wheel Drive and All-Wheel Steer. The live power in the front drivers grips the bank; the rear wheels are steered uphill, and the machine works steadily along the face of a slope too steep for an ordinary grader to negotiate.

Yes—All-Wheel Drive and All-Wheel Steer work together as a team to really go places and do things. We'd like to tell you the whole story . . . it's a good one.

AUSTIN-WESTERN COMPANY · *Subsidiary of Baldwin-Lima-Hamilton Corporation* · AURORA, ILLINOIS, U.S.A.

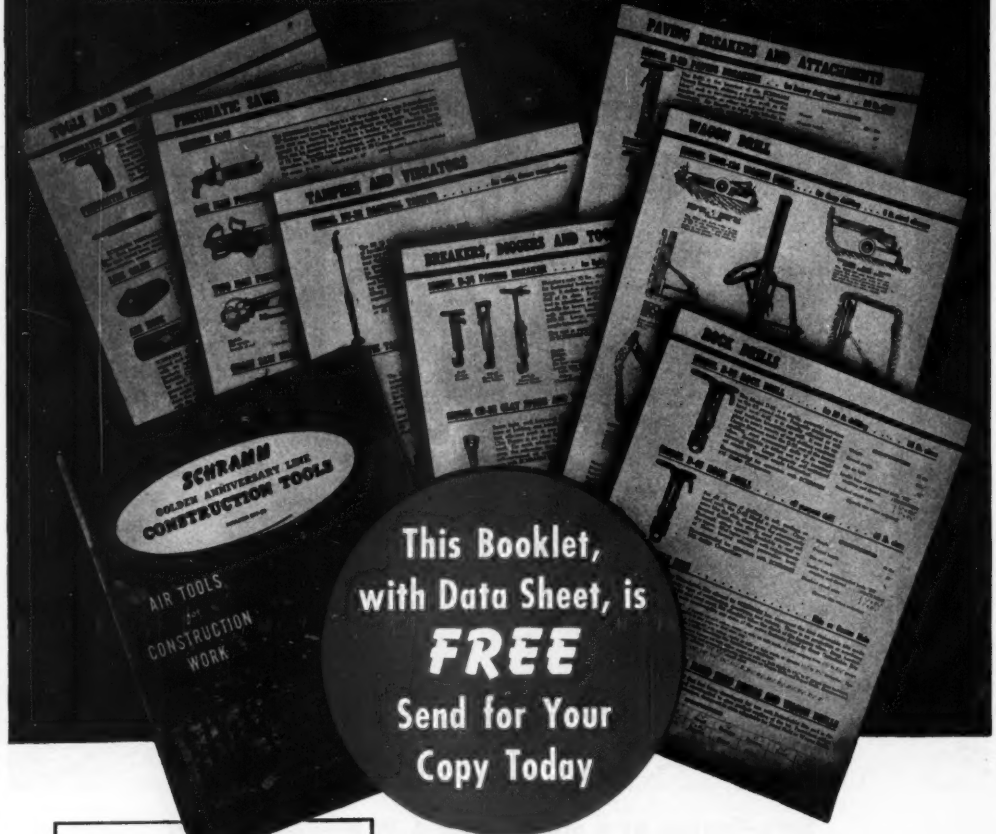
Austin Western

BALDWIN BLH LIMA HAMILTON

SINCE 1859—BUILDERS OF CONSTRUCTION EQUIPMENT

VALUABLE INFORMATION

ON HOW TO SELECT THE RIGHT AIR TOOLS



This Booklet, with Data Sheet, is FREE
Send for Your Copy Today

Partial list of contents:

- Rock Drills
- Wagon Drills
- Paving Breakers
- Sheeting Drivers
- Track Spike and Form Pin Drivers
- Clay Spades and Trench Diggers
- Backfill Tampers
- Tie Tampers
- Vibrators
- Pneumatic Chain Saws
- Pneumatic Circular Saws
- Hose and Accessories

Here is a helpful booklet to acquaint you with the latest designed SCHRAMM Air Tools — Tools for every Compressed air use. It is fully illustrated, giving design features which will show you why these tools perform smoothly, easily, yet powerfully.

You will find many uses for this booklet, so we urge you to write today for your free copy of SCT-50Z.

SCHRAMM INC.

The Compressor People • **WEST CHESTER** • **PENNA.**

MIXERMOBILE MANUFACTURERS

completely *Portable* CONCRETE

- WEIGH BATCHING
- MIXING
- ELEVATING

PLANT

CAPACITY UP TO 50 CU. YDS. PER HOUR

FROM RAW MATERIALS TO POURED CONCRETE

This ruggedly built trio means more jobs covered...reduced labor costs...savings in time and expense of making stationary installations. All functions are performed by one operator on each unit. Completely portable equipment travels at normal highway speeds...setup time for complete operation is 15 minutes or less.

MIXERMOBILE WEIGH BATCHER • Model WB-1

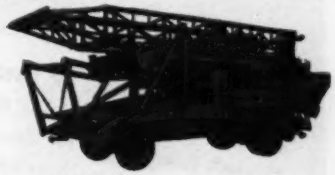
Completely portable unit weigh batches aggregate on the job. Can be charged with front end loader from storage piles or directly from dump trucks. Single operator sets up unit for operation in 15 minutes. Weigh batches up to 50 cu. yds. per hour.

- Three 7 cu. yd. bins and 2 cu. yd. skip store up to 23 cu. yds. of aggregate.
- Charging skip hydraulically operated.
- Bin selector located by skip control directs skip.
- Equipped with either dial or beam scales.
- Weight, 17,800 lbs; height, 12 ft.; width, 8 ft.; overall length, 28 ft. (with skip down).
- Mounted all around on 8.25x20 tires.

2-YD. MIXERMOBILE • Model M-7

Completely mobile concrete mixing and elevating plant eliminates cost of hauling and erecting expensive equipment. One man handles the entire operation from mixer to deck.

- Improved batch-timer and counter insures positive mixing time.
- New electronic water meter gives unerring accuracy.
- Sturdy planetary drive hoist clutches give extra power, durability.
- Mixes up to 50 cu. yds. per hour.



SCOOPMOBILE • Model C. The versatile Scoopmobile with exclusive planetary drive has 7 "quick change" attachments. Standard ¾-cu. yd. scoop bucket permits operator to keep Weigh Batcher unit performing to full capacity.

- Loads and transports aggregate.
- Transports, elevates and pours concrete.
- Lifts and places form panels, timbers, etc., up to 4,000 lbs. capacity.

ATTACHMENTS INCLUDE: Scoop buckets in various sizes, swivel and standard type concrete hoppers in ¾ cu. yd. capacities, lift forks, crane boom, track extensions with braces up to 26 feet overall.

Write for literature and address of your nearest dealer.

Mixermobile Manufacturers reserve the right to make improvements in design and specifications without notice.

MIXERMOBILE MANUFACTURERS

WAGNERMOBILE

Box 7527 • Portland 20, Oregon

AIR DOES IT-

STEERS CRAWLER

SETS TREAD LOCK

CROWDS - RETRACTS

LORAIN 820

At the touch of these levers, AIR does the work in the Lorain-820 in the 2-yd. class. Greater ease of control and maneuverability, less operator fatigue — more production is yours with "820" Air Controls . . .

STEERING . . . Air Does It!

Full air control of Crawler Steering — from operator's cab — with turntable in any swing position.

SETS TREAD LOCK . . . Air Does It!

Full air controls of Tread Locking Pawls, from operator's position with turntable in any position of swing.

JAW CLUTCHES . . . Air Does It!

Travel and Crowd turntable Jaw Clutches shifted by full air control.

CROWD BRAKE . . . Air Does It!

Full air control of Crowd Brake through hand trigger on lever. No need to relinquish machine control.

AIR ASSIST for Crowd & Retract . . . Retains Clutch "Feel"

Reduces operator effort — permits full "feel" of crowd, retract, travel clutches.

STANDBY FEATURES . . .

All air controls are equipped for mechanical or manual auxiliary operation. *Immediate* take-over— no adjustments, no loss of time.

THE THEW SHOVEL CO., LORAIN, OHIO

THE NEW LORAIN

HERE'S WHAT USERS SAY ABOUT THE DEMPSTER-DIGGSTER—

"IT'S THE FASTEST, MOST EFFICIENT EXCAVATING TOOL I HAVE USED"

—A. J. METLER, *Contractor*

"During the past several years," Mr. Metler says, "I have owned and operated four conventional full revolving crawler and truck mounted shovels and cranes and know that they have a direct application to many types of excavating work.

"On the other hand, I have learned that the fast operation of the tricycle mounted Dempster-Diggster permits it to be used on certain types of work to a considerable advantage. Its mobility permits quicker transfer from one job to another.

"I have had excellent results from the Dempster-Diggster and consider it the fastest and most efficient excavating tool I have used."

Mr. Metler is one of the many contractors who has found the Dempster-Diggster to be "the fastest and most efficient excavating tool" available.

This speed and efficiency in excavation work is accounted for, mainly, by the Diggster's exclusive independent hydraulic crowd and hoist action, its hydraulic steering and wheel-type traction.

The power crowd permits bucket to keep digging until loaded . . . no digging with wheels. The hydraulic steering gives the driver sensitive, easy, finger-tip control. When accelerated, a one-handed twist of the steering wheel puts the machine in any desired position. By operating on rubber-tired wheels, the Diggster, of course, can move at the fastest possible speed on the job and to and from jobs.

The Type HL Dempster-Diggster is equipped for extraordinary high dumping. The bottom of bucket is 13 feet six inches above ground.

HERE IS THE NEW TYPE HL DEMPSTER-DIGGSTER shown excavating with a 1¼ cu. yd. (heaped) digging bucket. The Type HL Dempster-Diggster will dig through an 18 foot bank while the Type GRD digs through a 15 foot bank.

The Dempster-Diggster is a "must" for contractors, large or small operators alike.

The Dempster-Diggster has a 15 foot turning radius, is 20 feet long when bucket is in traveling position, and is nine feet and six inches in height.

Four standard interchangeable buckets of two types are available. Digging buckets with four bottom teeth in 1 and 1¼ cubic yard (heaped) capacities, and materials handling buckets in 1½ and 2 cubic yard (struck) capacities.

For fast, efficient operation in difficult terrain, the Diggster is available with crawler-type traction.

"I have not personally used the Dempster-Diggster mounted on crawler treads," Mr. Metler said, "but have seen it in operation on jobs adjacent to mine. I know it is a very effective tool and has many applications."

Construction men have found that on big jobs the Dempster-Diggster has no equal for working in tight places and for freeing big shovels for heavier work. The Diggster has an 8 foot 10 inch crowing reach, will dig through a 15 foot bank, and will dig 15 inches below grade.

Pound for pound, the Dempster-Diggster will out dig and out load any other available competing machine in tough going! Let us prove that statement!

Write today for complete information and prices. The Dempster-Diggster is a product of Dempster Brothers, Inc.

This is the type GRD Dempster-Diggster, which Contractor A. J. Metler considers "the fastest and most efficient excavating tool I have used." It is shown digging 15 inches below grade.

DEMPSTER DIGGSTER

DEMPSTER BROTHERS

3111 SHEA BLDG.

KNOXVILLE 17 TENNESSEE

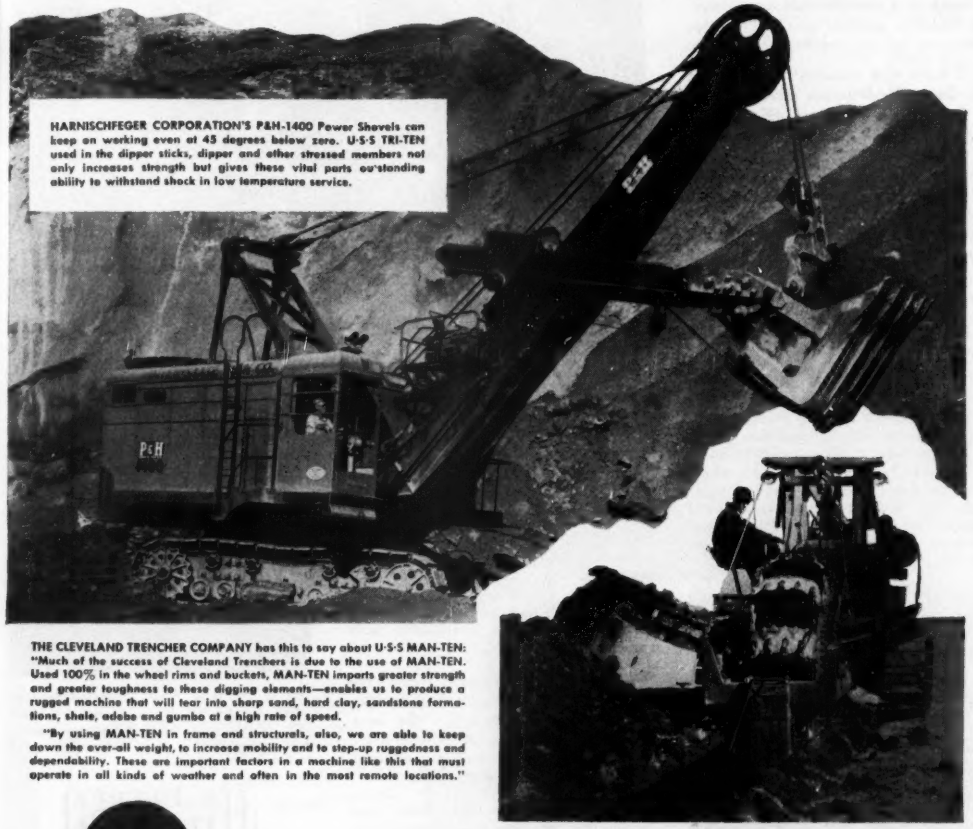
Give it the stamina

Build your heavy-duty equipment stronger, tougher and

Here's a report from the Harnischfeger Corporation, makers of the famous P & H Power Shovels that shows how these tougher, stronger "*steels that do more*" will keep equipment working under conditions that ordinarily play hob with operations. Every designer, every materials engineer and every contractor who has been plagued with part breakage during cold spells will appreciate its importance.

Says Harnischfeger: "We have used U·S·S TRI-TEN principally in our power shovel products. The continual trend to increased loading capacities together with more severe field service has greatly accelerated the use of this type of U·S·S High Strength Steel.

"Generally speaking, we have found that by replacing ordinary structural steel with TRI-TEN, the weight of our component parts has been reduced 25%. Allowable working stresses have been increased 50%—from 16,000 to 24,000 psi. What's more, TRI-TEN has enabled our P&H-1400 power shovel customers to operate this equipment in temperatures as low as minus 45°F."



HARNISCHFEGER CORPORATION'S P&H-1400 Power Shovels can keep on working even at 45 degrees below zero. U·S·S TRI-TEN used in the dipper sticks, dipper and other stressed members not only increases strength but gives these vital parts outstanding ability to withstand shock in low temperature service.

THE CLEVELAND TRENCHER COMPANY has this to say about U·S·S MAN-TEN: "Much of the success of Cleveland Trenchers is due to the use of MAN-TEN. Used 100% in the wheel rims and buckets, MAN-TEN imparts greater strength and greater toughness to these digging elements—enables us to produce a rugged machine that will tear into sharp sand, hard clay, sandstone formations, shale, adobe and gumbo at a high rate of speed.

"By using MAN-TEN in frame and structurals, also, we are able to keep down the over-all weight, to increase mobility and to step-up ruggedness and dependability. These are important factors in a machine like this that must operate in all kinds of weather and often in the most remote locations."

USS TRADE MARK

U·S·S HIGH STRENGTH STEELS

UNITED STATES STEEL

to stay on the job...

more durable with these U·S·S High Strength Steels

Now—when equipment is being called upon to deliver the utmost in performance—*dependability* becomes of prime importance, so bear these facts in mind:

- **Whenever your design requires that the steel must have high yield point, high tensile strength, good corrosion resistance and ability to stand up at normal and sub-zero temperatures . . .**
- **When parts must possess a high strength-to-weight ratio, must resist abrasion and have high resistance to fatigue failure . . .**
- **When the steel must, in addition, lend itself readily to fabrication and machining . . .**
- **You can satisfy all these requirements, without adversely affecting the cost of your product, by building with U·S·S High Strength Steels.**

U·S·S TRI-TEN, U·S·S COR-TEN and U·S·S MAN-TEN are neither new nor untried. In literally hundreds of thousands of applications they have proved their ability to keep equipment on the job—to minimize down-time and maintenance costs—by increasing the strength, ruggedness and durability of parts subjected to unusual stresses or destructive conditions.

Our engineers and metallurgists have had 15 years' experience applying U·S·S High Strength Steels to all kinds of equipment. Let them show you how these tougher, stronger steels can be applied to your product to make it more efficient and dependable.

AMERICAN STEEL & WIRE COMPANY, CLEVELAND
COLUMBIA STEEL COMPANY, SAN FRANCISCO
NATIONAL TUBE COMPANY, PITTSBURGH
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL COMPANY, PITTSBURGH
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S TRI-TEN

This manganese-nickel-copper steel has a yield point of 50,000 psi min. and a tensile strength of 70,000 psi min. in thicknesses ½" and under, with moderately lower values as thickness increases to a maximum of 4". It has superior toughness and ability to withstand shock at sub-zero temperatures. It has greater resistance to abrasion than structural carbon steel (ASTM A7) and its fatigue resistance is 50% higher. U·S·S TRI-TEN'S resistance to atmospheric corrosion is slightly superior to copper steel.

Because U·S·S TRI-TEN has very good welding properties in intermediate and heavier thicknesses, this grade of U·S·S High Strength Steel is particularly recommended for application in heavy duty equipment where maximum ruggedness and strength with minimum weight are prime requisites. U·S·S TRI-TEN is produced in plates, structural shapes, bars and bar shapes.

U·S·S COR-TEN

U·S·S COR-TEN is a ductile, low-carbon chromium-nickel-silicon-copper-phosphorus steel having a yield point of 50,000 psi min., and a tensile strength of 70,000 psi min. in thicknesses ½" and under.

Its resistance to abrasion and shock is superior to structural carbon steel; its fatigue resistance—that is, its ability to withstand repeated stresses—is 50% greater.

What particularly distinguishes U·S·S COR-TEN is its unusually high resistance to atmospheric corrosion—4 to 6 times that of plain steel, 2 to 3 times that of copper steel. This property helps to assure the long life and low maintenance cost of any equipment in which COR-TEN is used, whether to obtain greater durability or to reduce weight.

U·S·S COR-TEN is produced in all standard products—plates, shapes, bars, sheets, strip, special cold formed sections, wire and tubular products. Recommended particularly in light and intermediate thicknesses.

U·S·S MAN-TEN

U·S·S MAN-TEN is a grade of manganese-copper steel that, at relatively low cost, provides toughness, workability and weldability in a higher degree than obtainable in carbon steel of the same strength level. Its atmospheric corrosion resistance is slightly higher than that of copper steel.

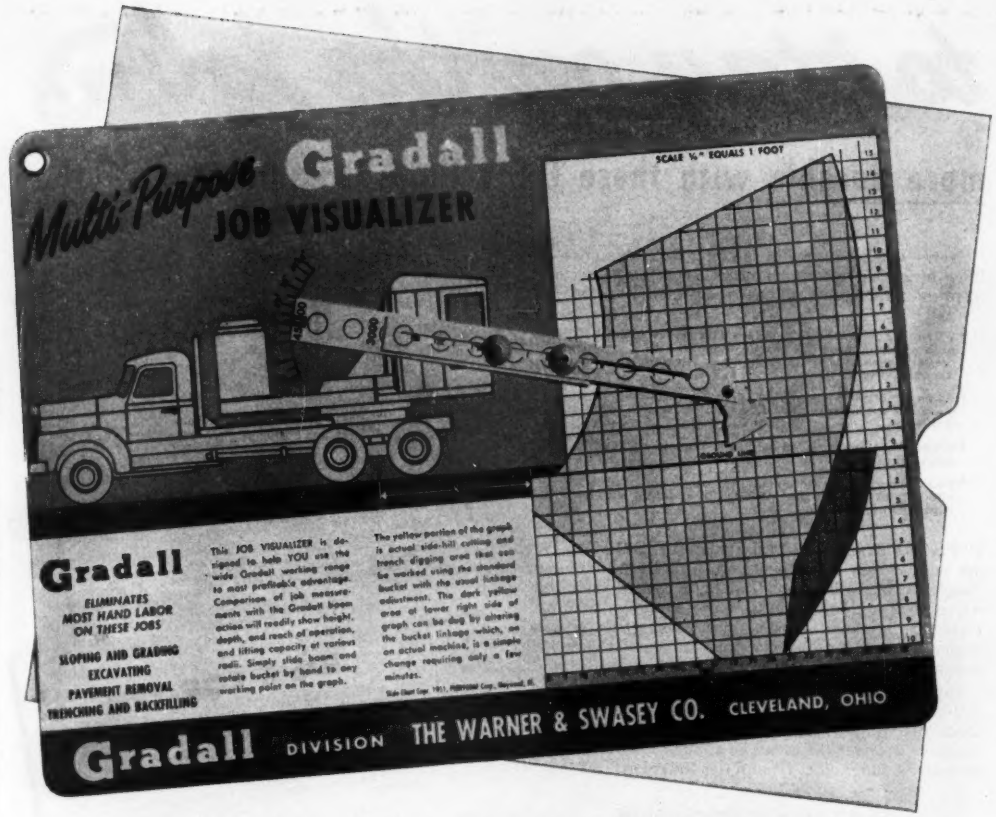
U·S·S MAN-TEN, in thicknesses up to ½" inclusive, has a yield point of 50,000 psi min. and tensile strength of 75,000 psi min. Its abrasion resistance is greater than that of structural carbon steel (ASTM A7); its resistance to sudden shock is about 20% greater; its fatigue strength is approximately 40% higher, insuring greater ability to withstand vibration and reversal of stresses.

U·S·S MAN-TEN is produced in plates, shapes, bars, sheets, strip, special cold-formed sections and other forms. It is particularly recommended for use in light and intermediate thicknesses.

LaPLANT-CHOATE give three good reasons for using U·S·S COR-TEN in their high speed Moto-Scraper: "*Increased endurance limit.* The life of several parts of this machine is governed by the fatigue limit of the steel. You will readily understand what the use of high strength steel as against mild steel means in this respect."

"These machines often self-load large boulders, etc. and the *resistance to impact* of high strength steel we have found is far superior to mild steel."

"High strength steel polishes considerably more than mild steel with this type of use our machine is subjected to. This enhances the loadability as well as the unloading of the machine."


Multi-Purpose Gradall
JOB VISUALIZER
SCALE ½" EQUALS 1 FOOT
Gradall
ELIMINATES MOST HAND LABOR ON THESE JOBS
SLOPING AND GRADING
EXCAVATING
PAVEMENT REMOVAL
TRENCHING AND BACKFILLING
This JOB VISUALIZER is designed to help YOU use the wide Gradall working range to most profitable advantage. Comparison of job measurements with the Gradall boom action will readily show height, depth, and reach of operation, and lifting capacity at various radii. Simply slide boom and rotate bucket by hand to any working point on the graph.
The yellow portion of the graph is actual side-hill cutting and trench digging area that can be worked using the standard bucket with the usual linkage adjustment. The dark yellow area at lower right side of graph can be dug by altering the bucket linkage which, on actual machine, is a simple change requiring only a few minutes.
Gradall DIVISION THE WARNER & SWASEY CO. CLEVELAND, OHIO

Send for this "JOB VISUALIZER" to see how versatile the Gradall really is!

YOURS FOR THE ASKING, the job visualizer shown above tells you exactly what this multi-purpose construction machine can do. In addition, the back side of the job visualizer, not shown here, gives you operation dimensions and specifications.

If you're already a Gradall owner, it will help you take the most profitable advantage of the machine's extreme versatility. If you're not, we think it will help you see immediately why the Gradall handles—simply and speedily—more types of construction work than any other machine.

Add to this the fact that the Gradall works with such precision that it eliminates a great deal of costly hand labor—and you'll want to call your Gradall Distributor for an early demonstration.

But take the first step. Write for your copy of the new Gradall Job Visualizer today.

THE WARNER & SWASEY CO.
5701 Carnegie Avenue • Cleveland 3, Ohio

Please send me, without charge, a copy of the Gradall Job Visualizer.

Name .....

Company .....

Address .....

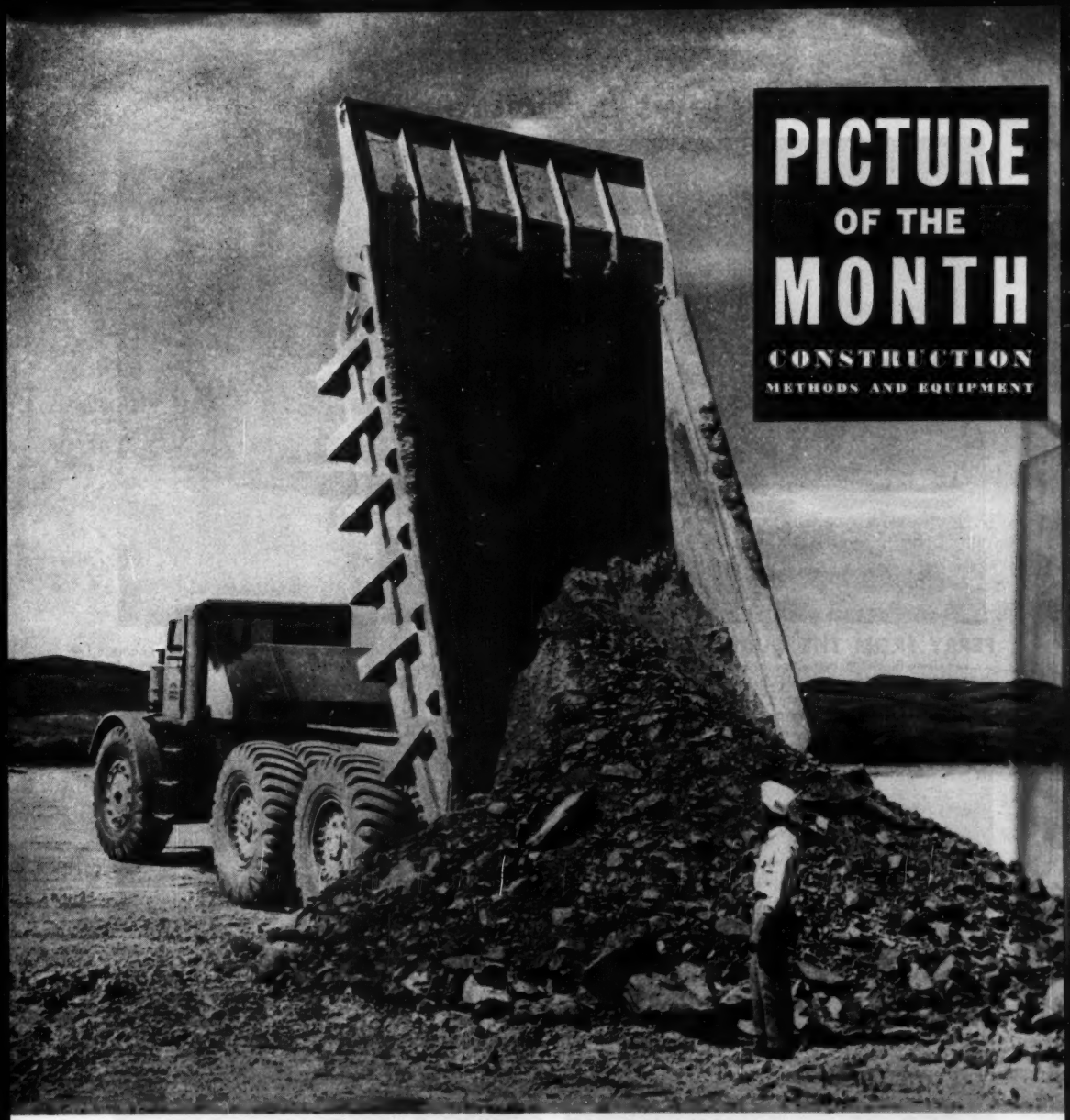
City ..... *State* .....

18-11-51

GRADALL—
THE MULTI-PURPOSE
CONSTRUCTION
MACHINE

Gradall®
DIVISION OF WARNER & SWASEY Cleveland

Gradall Distributors in over 60 principal cities in the United States and Canada



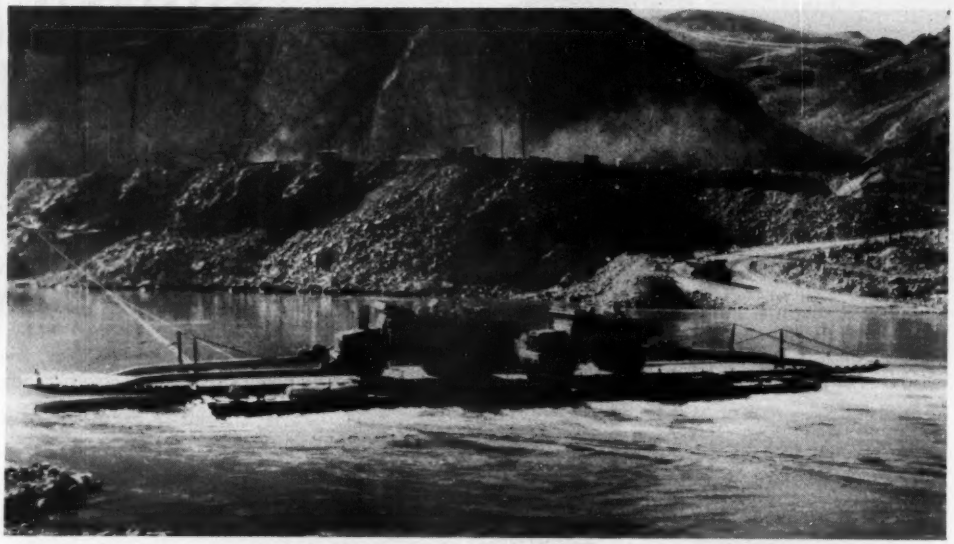
PICTURE OF THE MONTH

CONSTRUCTION METHODS AND EQUIPMENT

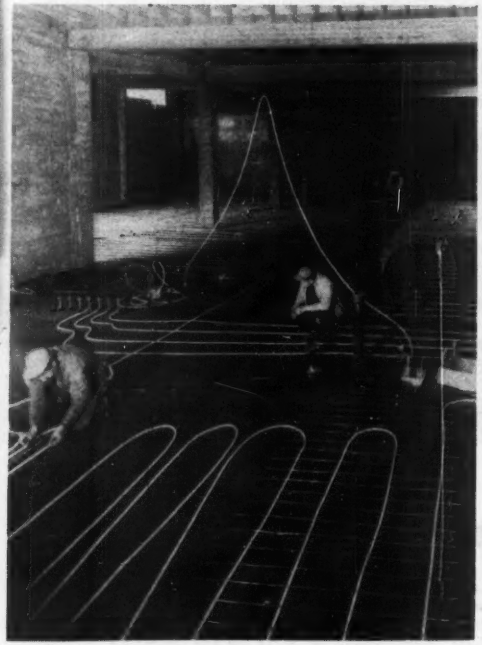
The Monster Goes to Work

BOUGHT AND SOLD, untried and untested—the fruit of a contractor's dream and a manufacturer's faith in his organization's ability—the first of ten Euclid Monster 38-yd end-dump trucks shows up at Ft. Randall Dam for duty. Western Contracting Corp., of Sioux City, ordered these big rigs for their 18-million yd embankment job at the big dam. Here's the first unit dumping her belly-full of Niobrara chalk on the right-bank fill. She's handling nearly 40 yd in one gulp. But this rig and her sisters are now on the Wichita Air Base job for Western, as the Ft. Randall earthmoving has been shut down until closure time next year. The Monsters are working with the 10-yd Marion diesel-electric shovel built as a companion piece of equipment. The trucks, each driven by a pair of 300-hp Cummins diesels, were described in CM&E June 1951, page 104.

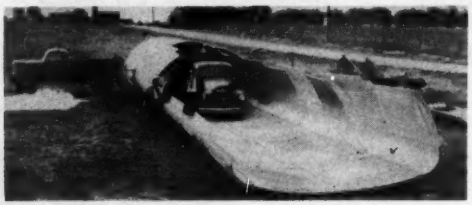
Construction News in Pictures...



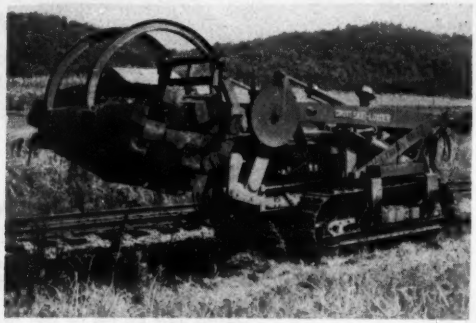
FERRY FROM THE QUARRY — Morrison-Knudsen end-dump Euclids loaded with rock are brought across the Columbia River just downstream of Grand Coulee Dam by a cable-drawn barge 110 ft long and 43 ft wide; capacity: 250 tons. Water-borne operation, now completed, was employed while riprapping river bank. — Photo courtesy of Em-Kayan Magazine.



PLASTIC PIPING — Radiant heating system under installation, using ¾-in. Carlon plastic tubing, for the Pump, Pipe and Power Co., Portland, Ore. After positioning, tubing is covered by wire mesh and 2½ in. of concrete poured. System is filled with water and pressure maintained during pour.



PREFABRICATION — Outagamie County, Wis., erected this 90-ft, Armco Multi-Plate Pipe-Arch in an adjacent field and skidded it into position after completion. Erection crew stands on bed of pickup truck to reach top plates. Finished culvert eliminated two narrow bridges at intersection.—Photo by Fred H. Lindner.



WORK ON THE RAILROAD — Southern Railroad salvages ties on 70 mi of abandoned track near Birmingham, Ala. International TD-14A tractor, equipped with Drott Skid-Loader, picks up and rolls ties into bundles where they are banded and carried to convenient loading points.

Specify UPSON-WALTON Fittings

Only UPSON-WALTON offers all three

1. WIRE ROPE
2. FITTINGS
3. TACKLE BLOCKS

You get full take-up on this turnbuckle!

WITH a 12" Upson-Walton turnbuckle you always get 12 inches of take-up. To attain this uniformity the bodies are *drop-forged* to size and shape in accurately made dies. This is but one of the refinements in design and manufacturing technique you get with Upson-Walton fittings.

After forging, bodies and fittings are straightened to insure a true thread.

Body reins are wider than the shank diameter—thus threads are protected. Since the reins are constructed with ample section and rigidity, a bar may be inserted to set up tension with safety.

It pays to specify Upson-Walton fittings—wire rope and tackle blocks too. Ask your Upson-Walton distributor for further information. *The Upson-Walton Company, Cleveland, Ohio. District offices in New York, Chicago, Pittsburgh.*

What Goodyear is doing about the Highway Crisis

—in the public interest—and yours!

In behalf of the modern highway system that this country needs so desperately, Goodyear is running two-page, full-color advertisements like these in the Saturday Evening Post and Collier's—

Another reason why it pays always to BUY and SPECIFY

GOODYEAR

THE GREATEST NAME IN RUBBER

Volume 33
Number 11

CONSTRUCTION METHODS AND EQUIPMENT

NOVEMBER
1951

Harold W. Richardson, Editor

Damned Silly Business

YOU MUST REDUCE your construction operations profit percentage by 10% under that charged during the base period July 1, 1949 to June 24, 1950. That simple fact is the sole intent and purpose of the ceiling price regulation for construction services under CPR 34, supposed (at this writing) to become effective November 1. Yet, to state this simple fact, OPS has dreamed up a most formidable document chock full of ambiguous Washington gobbledegook. Obviously, it was written by persons unfamiliar with construction bidding, estimating and cost procedure. And it probably will take a whole parcel of Philadelphia lawyers to fully interpret it.

This whole idea of trying to control construction prices by an OPS order is damned silly. We sounded off at length on this page last August on the subject under the heading: "What Price Construction—Or How Silly Can We Get?". The current OPS regulation really shows how silly we can get. It is meaningless, inane, unworkable, unintelligible—and it won't reduce or control the price of construction one bit. Except, possibly, in isolated cases of cost-plus contracts.

Why? Because OPS apparently refuses to—or can't—understand that construction is not a standard product whose price can be accurately figured in advance, and that no two construction projects are similar enough or are built under similar conditions to offer an intelligent comparison of prices. Construction bids aren't prices —they are but shrewd guesses by the contractors. If you are making widgets or shoes you can price your product after it is made. But construction is a commodity that is priced before the project is even started.

Yet, despite all this, OPS is attempting to control construction prices through control of *profit percentage*. So what? Just what is actual construction profit? It certainly has little relation to the arbitrary percentage a contractor adds to his bid for profit and contingencies. More realistically, his profit is based upon how close he came to ultimate costs in making his estimates; how closely he bet on the weather, on labor supply and efficiency, on material deliveries, on stream flow variations, on the success of new methods and use of equipment he has planned. All these, not a percentage of his bid, determine his profit.

Want to become real confused? Take a look at a few high spots in the regulation. You figure your ceiling prices in relation to current costs, but you use nine-tenths of the base period markup for profit on similar jobs over your estimated or actual costs, as the case may be (whatever that means). Your base period markup for overhead remains the same.

The order lists four types of contracts: Lump sum; cost-plus fixed fee; cost-plus percentage; and cost-plus with upset price. Nothing is said about unit price bidding, except for this vague mention: If you are requested to submit a bid on certain types of work in terms of unit prices you may adjust your submitted unit estimates in any manner so long as the total amount for the bid is no greater than the lump-sum ceiling price. You highway contractors who have never figured a lump-sum job in your life, figure that one out.

You can use the highest profit markup you used on similar jobs bid (presumably means the contract), or estimated (presumably means unsuccessful bids) during the base period. Wonderful! This puts a nice premium on high, unsuccessful bids, especially where there happened to be a nice big profit figured—you know the kind, you didn't want this particular job, but in case you got lucky and the job did come your way you'd have an exceptionally nice profit. Sure, it says here you can use that same profit percentage now if you want to.

How about it if you didn't happen to build or bid a similar job during the base period, or if you're brand new in the contracting business? Simple. You merely ascertain the profit figured for such work by your nearest competitor (how naive!) or you submit your entire bid figures to the OPS regional office for OK. But you can't use such figures for 20 days, and if OPS comes back for more info, then you must wait an additional 15 days. Remember how tough it is to close most bids an hour before opening? Now you simply close them 45 days earlier. Just how you do this in cases where the time from bid calling to closing is only two or three weeks we can't figure out. That's your problem.

On page after page of language transcending that of income tax instructions, you find you can increase equipment rental prices by a percentage equal to that of replacement cost of the machine today over its cost during the base period. Likewise, on time-and-material contracts you can up prices by percentage raises in labor rates and material costs. These two items come closest to making sense of anything in the document.

But, all in all, it's a formidable order. Any contractor who can wade through it and understand it deserves to fly an E flag over his shanty.

Oh, yes, the records. You must file scads of records on OPS forms; the Lord only knows what this means. Furthermore, you must keep all cost, pricing and estimating records for at least two years after expiration of the Act. And with warehouse space at such a premium now, too!

One contractor who attended the advisory board meeting suggests that a better attempt at the impossible control of construction prices might be written in three sentences: (1) You can't pay more than WSB established labor rates; (2) You can't pay more than OPS ceiling prices for materials and equipment; (3) Everybody should stop acting like a heel.

But that would be far too simple. The present order won't work, it can't work, and it won't affect construction prices in the least. One consolation: There are 2½ million people on the federal payroll. If all of them were put on enforcement of this order, it still would be meaningless.

Rich

Large Old Steam Crane Grows Smaller,

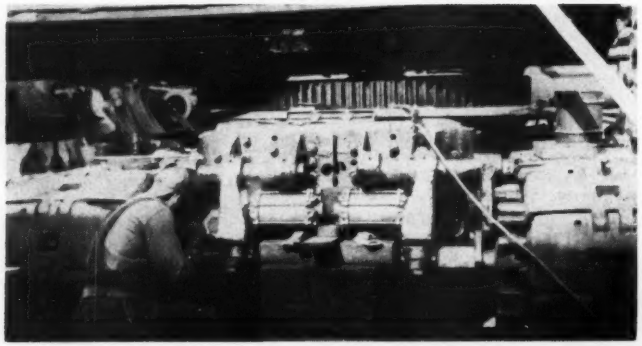
MARION 37 STEAM CRANE as it appeared before conversion to a piledriver crane. It was 16 ft 8 in. high (exclusive of the stack) and 12 ft 4 in. wide. For transport by truck or rail, it had to be dismantled. Rig was reconditioned from stem to stern during modification, making it a modern, high-capacity machine at a substantial saving. Considerable engineering work was entailed.

REBUILT MARION is loaded aboard a low-center railroad car under its own power—without disassembly of any units. Stack tilts back and down; shipping dimensions are 10 ft 8 in. x 13 ft 8 in.

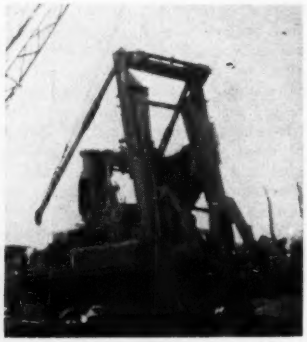
CONTRACTORS long have been noted for their skill in modifying standard construction equipment to meet specialized needs. Recently, the Drilled-In Caisson Corp., of New York, worked over an old Marion steam-powered crane and came up with a big-capacity piledriver crane built within dimensions that permit easing through highway and railroad clearances.

The firm's jobs require the driving of piles as large as 48 in. in dia and up to lengths of 70 ft. For this it needs at least a 2½-yd crane, with enough capacity to operate a Vulcan O hammer.

Steam is most economical for piledriving; but the nuisances associated with steam operations have brought the internal combustion engine into favor for crane power. Common practice has been to put a steam plant on the back of a diesel-powered rig for piledriving work.



THE OLD MACHINE first was torn down completely; all bushings, brakebands and pins replaced. A major modification was the narrowing of the underframe by 1 ft 8 in. Here, double-acting cushioned steam cylinders are being installed for improved steering control.

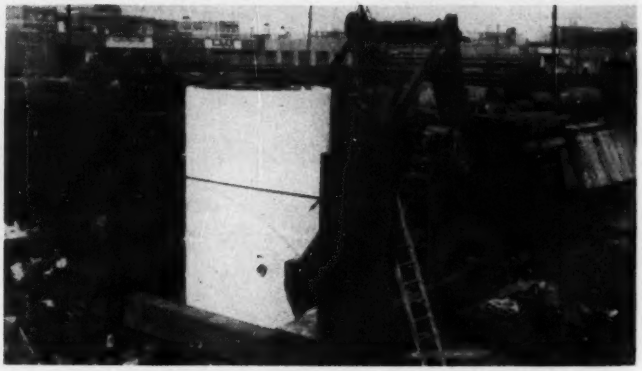


COLLAPSIBLE GANTRY is put into place. It is lowered when piledriver is in transit. Steam plant powers all operations.

Becomes Modern Piledriver Unit

By PAUL SOROS
Mechanical Engineer, New York, N. Y.

REAR END of machine is rearranged to permit lowering of boiler and combustion chamber. Note limited crawler clearance.



BOILER is insulated and starter compressor installed on table up forward, inside a new cab assembled from prefabricated parts. Boiler firing was converted from coal to oil and the 125-lb operating pressure of the unit can be built up in 12 min when necessary.

The extra cost for maintenance and replacement of the more complicated machinery on a gasoline or diesel crane is well worth paying in general crane work for not having to bother with steam. But this extra additional cost becomes a clear waste of money when a steam plant has to be put on the machine anyhow for piledriving.

On the basis of these considerations, Drilled-In Caisson Corp. decided to try something new. The corporation bought an old Marion 37 type, 2½-yd steam crane, to build from it a piledriver crane with dimensions within railroad clearances (height 13 ft 8 in., width 10 ft 8 in.).

The underframe had to be made 1 ft 8 in. narrower. This involved considerable machine-shop work and the cutting, welding and careful heat-treating of large steel castings. At the same time the old steering mechanism was replaced by more convenient, double-acting cushioned steam cylinders.

In order to reduce the height, the gantry was made capable of folding forward while holding the boom in a horizontal position. Raising and lowering can be done under the machine's own power to avoid the need for another crane at shipping points.

The boiler had to be lowered 3 ft and was converted from coal to oil fire. The stack was provided with hinges to be turned backward. Limitations on the height of the boiler and the necessity of clearing the underframe left little space for the combustion chamber which was designed specially to provide the necessary amount of secondary air for proper combustion. By using a 15-cfm compressor, driven by a 5-hp motor, the 125-lb operating pressure of the 85-B.H.P. boiler can be built up in 12 min. when occasion demands it.

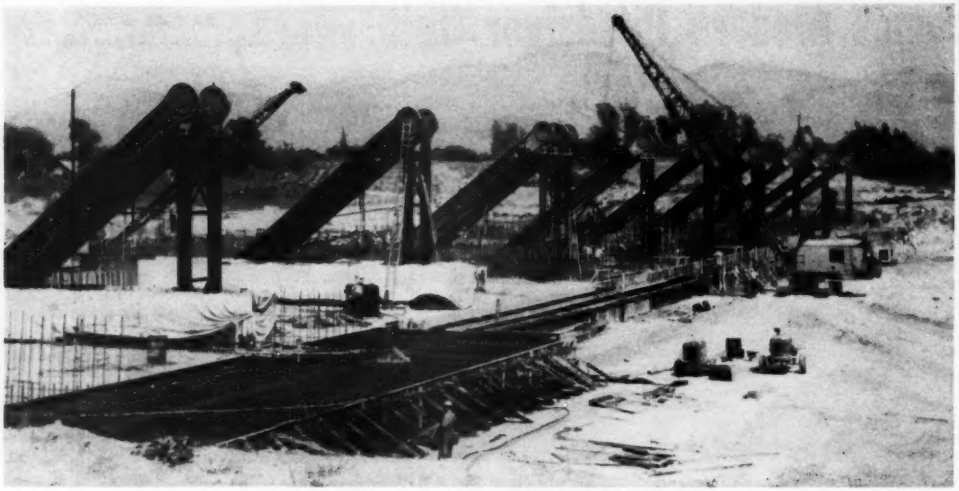
A brand-new cab was built of prefabricated parts that were assembled on the machine.

The entire job was done in an open yard requiring no more special equipment than a couple of jacks, a truck-crane, welding machine and mechanic's tools. The machine-shop work, brick work, painting, fabrication of the boom and cab were subcontracted.

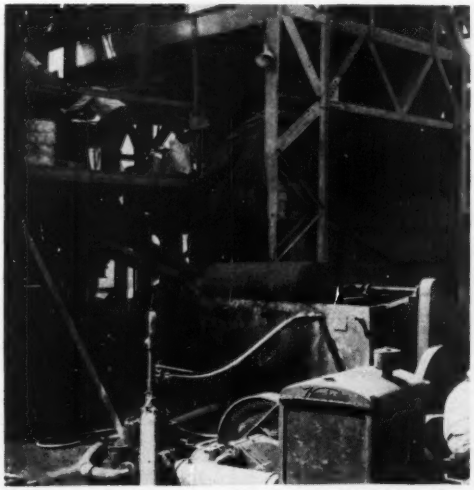
Total cost of the finished crane, including $2,000 for engineering fees, was less than half the cost to another contractor who built from scratch a somewhat smaller steam piledriver crane; and about $20,000 less than a diesel rig with a steam plant.

The work of conversion was accomplished from designs prepared by the engineering staff of Drilled-In Caisson Corp. and executed under direction of the author, who was mechanical engineer for the firm at that time.

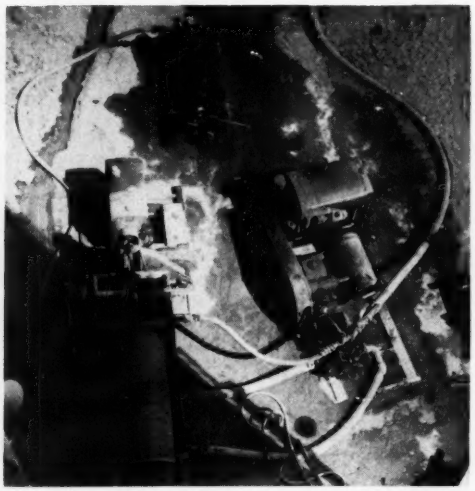
READY to "hit the road" on a heavy-duty trailer. Gantry folds forward, stack turns back on hinges, and catwalks around the cab fold down. Gantry-raising mechanism telescopes; highest point of the modernized machine is not more than 13 ft 8½ in. off the ground.



BASE SLAB to support radial gates on Whittier Narrows Dam spillway was poured by pumping grout into pre-placed aggregate. Prepakt Concrete Co., specialists in the field, did the pumping as subcontractor under Winston Bros. Co., general contractor on the $3,022,478 job. Reinforcing steel is set by men working on a convenient platform of pre-placed aggregate.



WORKMEN ADD ADMIXTURE to 2 1/3-cu yd double drum, grout mixer. Regular concrete mixers were not used for grout. Agitator (lower right) keeps grout in suspension.



GASOLINE POWERED PUMP (right) moves the grout 800 ft from batch plant to dam. Gardner-Denver machine will pump 20 cu ft of material a minute. Agitator cylinder (left) is screen-like.

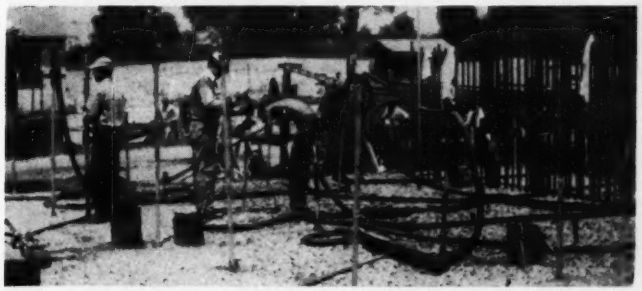
Pre-Placed Aggregate, Pumped

CONSTRUCTION SPECIFICATIONS for Whittier Narrows Dam in Los Angeles County, Calif., call for a concrete spillway slab 8 ft thick—to be "poured" by pre-placing the aggregate and pumping in the grout. This 110x564-ft slab is the largest concrete installation made thus far by the Prepakt method.

The method was developed by the Prepakt Concrete Co. of Cleveland, Ohio, which holds patents on the additive materials that make the process possible (CONSTRUCTION METHODS AND EQUIPMENT, June 1947, page 82). In the Whittier Narrows case, the company served as subcontractors to the general contractor (Winston Bros. Co.) for grouting the slab. Grout pumping was subcontracted because Prepakt specializes in this work.

Prepakt has licensed the Corps of Engineers and the U. S. Bureau of Reclamation to use the process.

FOUR SMALL PUMPS move the grout into the pre-placed aggregate. Second agitator in background holds material until taken by the 4.8-cfm pumps. Gravel and pre-placed grout pipes for section yet to be pumped are in foreground.



GROUT PUMPING continues from one end of a block to another. Grout surface in the aggregate slants downward from start of pumping toward other end of block.

RAISING GROUT PIPES as grout rises in gravel is sometimes a tough job. Tip of pipe is kept 6 in. under grout surface. It must be raised gradually to keep pumping head from becoming prohibitive. Contractor can train own crew in Prepakt method.

GROUT BOILS UP around bottom of 1¼-in. dia pipe. This is the signal to quit pumping through that pipe.

Grout Make Concrete Spillway

Where pumped-grout concrete is specified, it will be up to the general contractor to decide whether he wants to do the job himself or to subcontract the grouting to Prepakt.

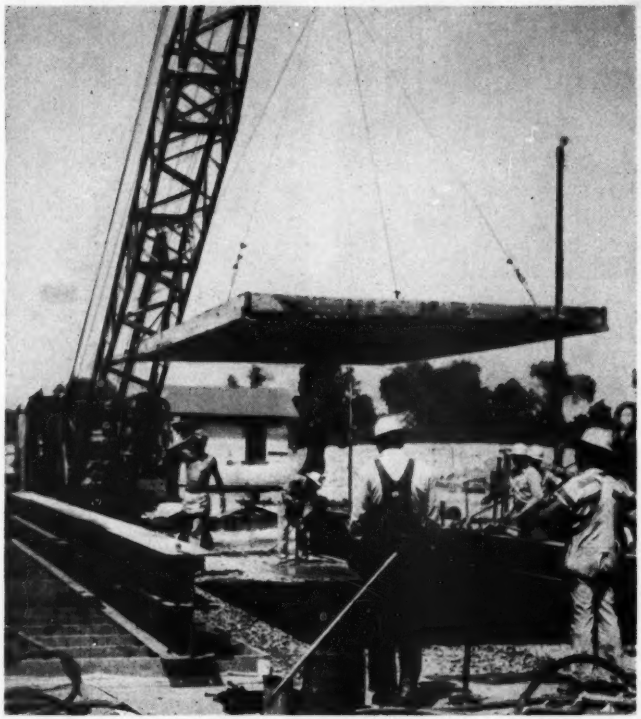
The fact that Prepakt Concrete Co. has developed the method and for that reason has the equipment and know-how to do the work is a compelling argument in its favor. However, it is not mandatory on Corps of Engineers and U. S. Bureau of Reclamation jobs that Prepakt be retained. The licensor will be in the picture in any event, as supplier of additive materials necessary to make the process effective.

At Whittier Narrows, in addition to design reasons for using the Prepakt process, there was a vital construction reason; namely, that this system saves on the size of concrete batching and mixing facilities required.

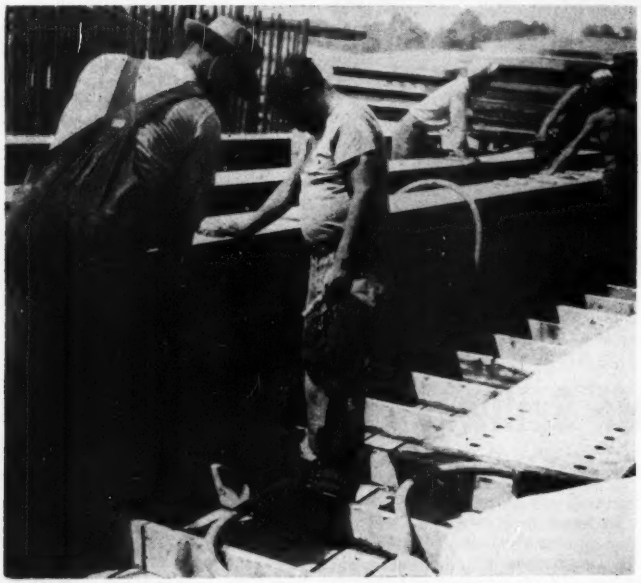
Using standard concrete pouring methods, the engineers figured that the smallest size pour that would be feasible on this 18,000-cu yd slab would involve about 1,100 cu yd. And these pours would be bigger than any other on the job. Such pours would require a substantially larger mixing and batching plant than would be required for doing the same job by the Prepakt method.

For the Whittier Narrows spillway, the general contractor built the forms, installed the reinforcing steel and graded aggregate and placed the grout pipes. Here, the subcontractor took over. Use was made of the batching facilities required for other work on the job, except that an additional silo and batcher were installed for the pozzolanic admixture used in the grout.

Mixing and pumping the grout took special equipment that was supplied by the subcontractor. This includes a double-drum, gas-powered, 2 1/3-cu yd mixer followed by a primary agitator, a primary pump, a secondary agi-



TOP FORM is lowered into place for final grouting. Form is faced with 1x6 timber with 1-in. clear space between pieces. On that is fastened diamond-shaped metal plaster lath, screening and then muslin. Heavy H-beams weigh down forms.



SURFACE GROUT IS APPLIED through holes in the top form on 2-ft centers. Air-operated Viber vibrator was rebuilt to vibrate the forms and bring grout mixture evenly to the surface.

WORKMAN QUICKLY INSERTS PLUG in hole to prevent loss of grout when filler pipe is removed. Grouting is stopped when water from mix is worked up through the muslin-screen-metal lath facing of the top form and into the space between sheeting.

tator and a battery of four secondary pumps. Top forms were built according to designs of the subcontractor.

Grout pumping takes an experienced crew but training can be done by a contractor.

At Whittier Narrows, pours were divided into 2,000-cu yd units. The aggregate as pre-placed for each block had 37% void space. That means that only 740 cu yd of grout was needed for each pour.

Pumping this quantity took about 24 hr of continuous work. This was done nine times for the entire 18,000-cu yd slab.

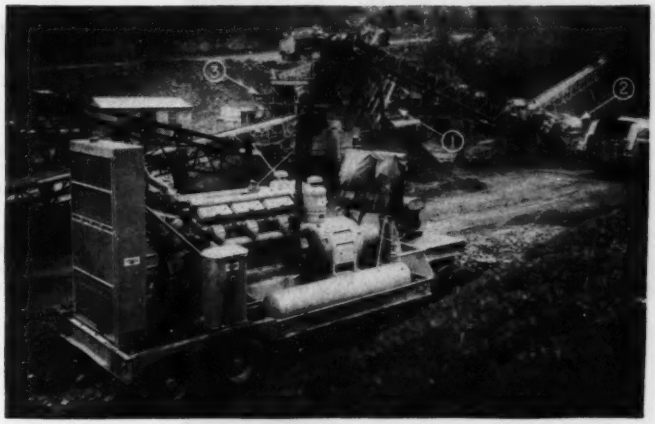
The subcontractor had two crews, each of which worked on a 12-hr basis when pours were made. The job was so organized that a pour was made about every four working days until the nine pours were completed.

Project Data

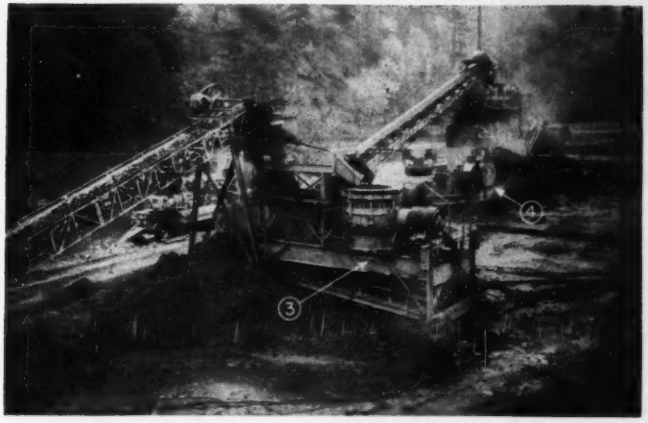
Whittier Narrows Dam is a $36-million flood control project for the Los Angeles drainage area under construction by the Los Angeles District, Corps of Engineers. Col. W. R. Shuler is district engineer; J. G. Morgan is resident engineer.

Ben Richards is superintendent for the general contractor on the work, Winston Bros. Co. Project superintendent for Prepakt Concrete Co. was Kline McKinzie. L. S. Wertz is president of Prepakt with headquarters in Cleveland, Ohio, and R. E. Davis, Jr., is West Coast field engineer with offices in San Francisco.

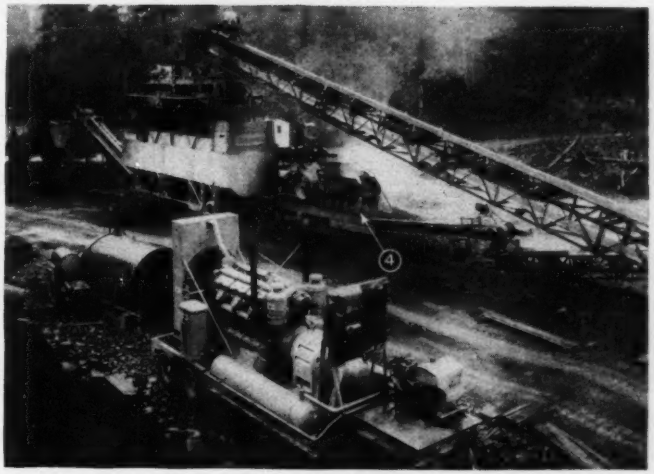
All-Electric Agg Plant Pours Out the Stone



TO PRODUCE AGGREGATE for its 19-mi, $95,000 resurfacing job on Clackamas River Road leading to Mt. Hood National Forest in Oregon, Portland's Newport Construction Co. set up this efficient plant. Main units are: (1) 25x40 Cedar Rapids primary jaw crusher with apron feeder; (2) 9x40 Austin-Western jaw with CR screen; (3) 3-ft Telsmith Gyrasphere with El-Jay screen; (4) 22x40 Pioneer roll re-crusher (below). Trailer-mounted diesel-generator set furnishes all power for smooth-running gravel operation.



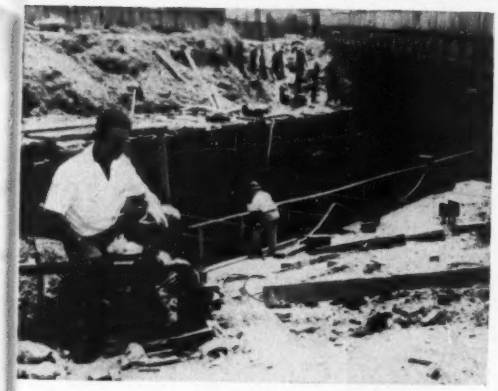
SINGLE FRAME carries screen, crusher and conveyor for quick job moves. Like rest of crusher mountings, conveyor frames and other steel work, it was built in contractor's shop. At right rear, is Clackamas River from which 1¼-yd Manitowoc dragline digs coarse, tough gravel to feed the plant, loading into two Koehring Dumptors for direct delivery to primary crusher. Plant produces average 100 cu yd per hr of surfacing material (¾-in.-minus) and three sizes of oil rock (¾-½, ½-¼ and ¼-in.-minus).



FINAL SCREENING UNIT is pair of 4x12-ft Telsmith Pulsators mounted atop steel storage bins. Bins, with integral reclaiming belt beneath, are wheel-mounted for easy travel. Oversize from screens is reduced by re-crusher (4), while finished product from bins goes by inclined belt to truck-loading hopper set over depressed driveway (far left). Power for all-electric plant comes from Caterpillar 400 hp diesel driving 300-kw generator on LaCrosse trailer. Gardner-Denver compressor and air tanks are for starting diesel.—Caterpillar Photos

DEEP-WELL PUMPS...

Team Up to Tame Tough



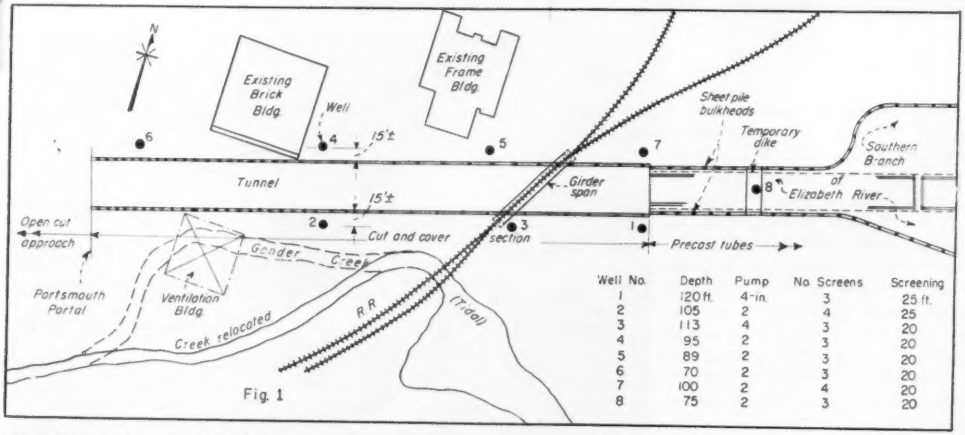
DEEP-WELL PUMPS are key to water control on cut-and-cover section of Norfolk-Portsmouth tunnel. Only two 4-in. pumps (top) and six 2-in. submersible units (bottom) lowered groundwater while 50x580-ft excavation was carried 67 ft below river level.

A DARING ATTACK—carefully planned and well executed—has whipped a tough cut-and-cover section of the Norfolk-Portsmouth vehicular tunnel in Virginia. With a tidal river and creek only a few feet away on two sides of the job, New York's Sterling Foundations Inc. has excavated a 50x580-ft hole 67 ft below mean high water level at the deepest, river end. Despite the cut's depth and nearness to water, its sides are held by open horizontal sheeting and the area is kept dry by only eight deep-well pumps.

But the open sheeting and deep wells—far more economical than other methods of dewatering would have been—are not the only money-saving features of the work. Undisturbed berms eliminate one complete line of cross-lot bracing. And the welded bracing system itself, sloping parallel with the tunnel, does not interfere with pours.

Sterling's job is a subcontract from Merritt-Chapman & Scott Corp., which is building a 3,350-ft trench-type tunnel under the Southern Branch of the Elizabeth River (CM&E, May 1951, page 48). The subcontracted section—560 ft of cut-and-cover tunnel on the Portsmouth side—is at a difficult site. The river runs along the deep end of the cut, a tidal tributary flows along one side, and the Seaboard Air Line Railway crosses on a 40-deg skew. Borings showed sand, clay, gravel, silt and shells.

General scheme was to drive soldier-beam piles along both sides of the cut to hold horizontal louvered sheeting. This open sheeting, unlike a tight system such as sheetpiling, would relieve any hydrostatic pressure behind it so bracing would have to support



Well No.	Depth	Pump	No. Screens	Screening
1	120 ft.	4-in.	3	25 ft.
2	105	2	4	25
3	113	4	3	20
4	95	2	3	20
5	89	2	3	20
6	70	2	3	20
7	100	2	4	20
8	75	2	3	20

SITE PLAN at Portsmouth side of Elizabeth River shows dewatering wells spotted alongside cut and in river-end dike. Sterling Foundations Inc., subconstractor for this section of tunnel, called in Layne-Atlantic Co. to install wells, whose use was an eye-opener to latter firm—it was first time it had been hired to drill wells to get water simply to be thrown away.

...OPEN SHEETING

Cut-and-Cover Tunnel

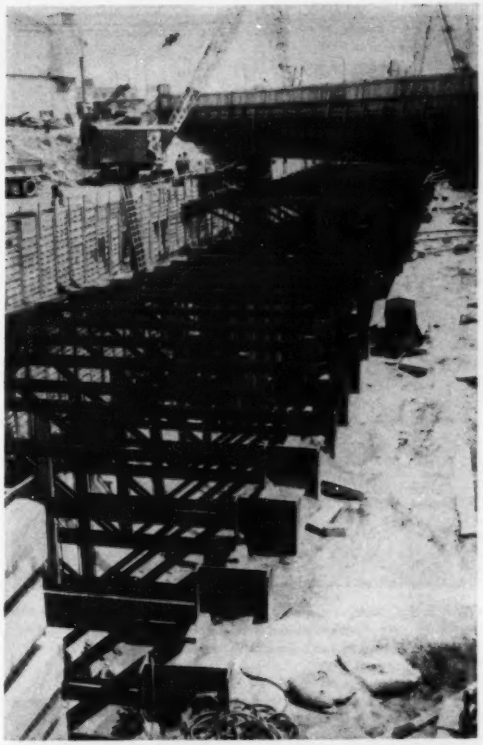
earth loads only. Deep wells behind the sheeting would keep groundwater down. Unlike some of the more conventional unwatering systems, the wells would be less likely to silt up in the fine material expected.

Top of soldier piles was to be El.–5, while general site grade was +8. So that these soldiers could be driven full depth at one sitting, without redriving, excavation of the top 13 ft was started with two 1½-yd draglines.

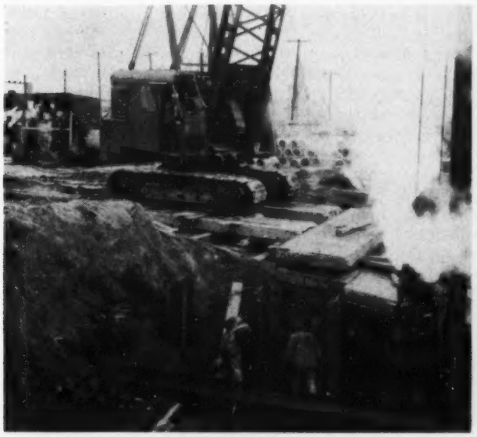
At El.+4, they struck water. This was taken care of by a simple surface drain—a glory hole, clammed out to El.–5, with a 6x6-ft screened timber frame inserted and surrounded by gravel. In two weeks, one 6-in. centrifugal pump sucking in this sump lowered water table 9 ft. to El.–5, and inflow dropped from 200 gpm to 10. Meanwhile, excavation continued.

During all this time there was great uncertainty over the correct interpretation of original borings. Besides the great variety of subsurface material, they indicated strata of silt over porous sand layers 6 in. to 10 ft thick at elevations from –10 to –25. This ground condition was conducive to a blow through the silt if pressure in the sand underneath was not relieved. Accordingly, while excavation went on, No. 1 well *(Fig 1)* was put down alongside the river end of the job to get additional information both as to underlying material and water inflow.

This first well, started with a 6-in. cutter-head pipe and enlarged to 8 in., was bottomed at El.—120. Before its 4-in. pump was started, several boils occurred when site excavation reached –5. The pump was put

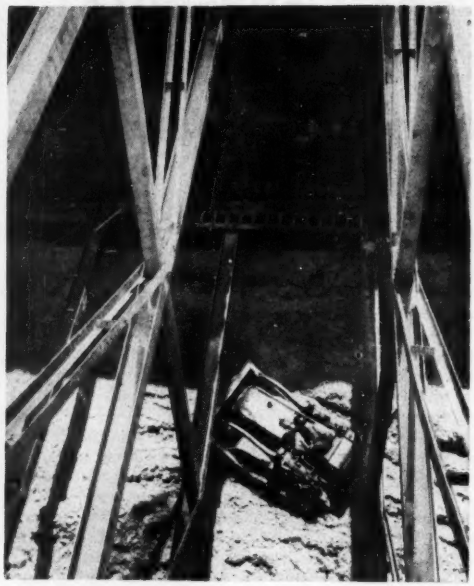


OPEN SHEETING and heavy cross-lot bracing hold sides of wide, deep cut. Railroad bridge (top) complicates job, as does building (bottom rear), underpinned by jacks and held by extra braces.

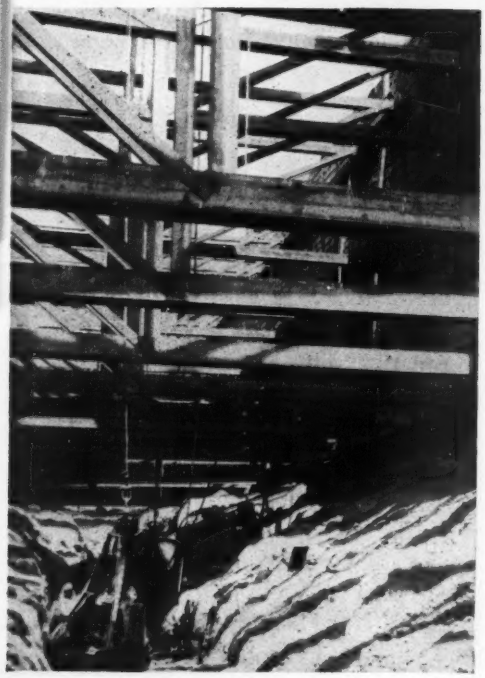


SOLDIER BEAMS to hold louvered sheeting are driven by Manitowoc crane handling McKiernan-Terry 10-B-3 hammer on spud lead. Steam is supplied by Littleford Vapor Kwik-Steam generator (left rear).

CLAMSHELL handles general excavation as men with mattocks and shovels trim between soldiers for insertion of louvered sheeting. Bracing is posted to cut's floor until trussing is placed.



BULLDOZER, an International TD-9 with Bucyrus-Erie blade, moves spoil to clamshell in deep cut. Material at this level is marl that becomes soupy and quick when worked, unless kept dry.



HIGH BERM is left at base of cut to eliminate need for another level of bracing below tunnel subgrade. Almost hidden behind bucket is one of open sumps that collect surface water inflow.

in operation, the boils stopped, and test pipes 75 ft away from the pump in two directions showed groundwater lowered 33 ft in less than three days. Maximum discharge was 220 gpm.

Success of the first well, and an analysis of its cuttings taken during drilling, indicated that the job could be kept dry—successfully and economically—by a series of such wells.

So seven more wells were put down. Like the first, these were installed for Sterling by Norfolk's Layne-Atlantic Co. Procedure for each well was to sink a 2-in. hollow drill rod fitted with a large drill bit to cut a 6-in. dia hole. A clay slurry was pumped down through the center of the rod while drilling. As the slurry flowed up outside the pipe, it plastered the sides of the uncased hole to hold the wall, and also carried off drill cuttings. These were collected and recorded as for wash boring. On the basis of this logged information, a pipe with 5-ft bronze screens inserted at required elevations was tailor-made to draw water from porous layers at various depths. Screening, sometimes set in as a 10-ft double length, totalled 20 to 25 ft per well.

After a well was bottomed (at elevations from −70 to −120), the drill rod was pulled out and the prepared screen pipe was inserted in the hole. A high-pressure jet in the screen pipe forced water up around the outside to wash away the clay plastered by the drilling slurry. At the same time, pea gravel was dropped around the outside to form a clean, full length filter. Jet water also flushed out pockets of fines, which the gravel replaced, and one well (nominal 8-in. dia, 125 ft deep) required 40 cu yd of pea gravel before its ring filter was completed.

All wells were designed to take 4-in. pumps run by 10-hp, 220-v electric motors. When water inflow proved small (a total 600 gpm at the beginning and dropping

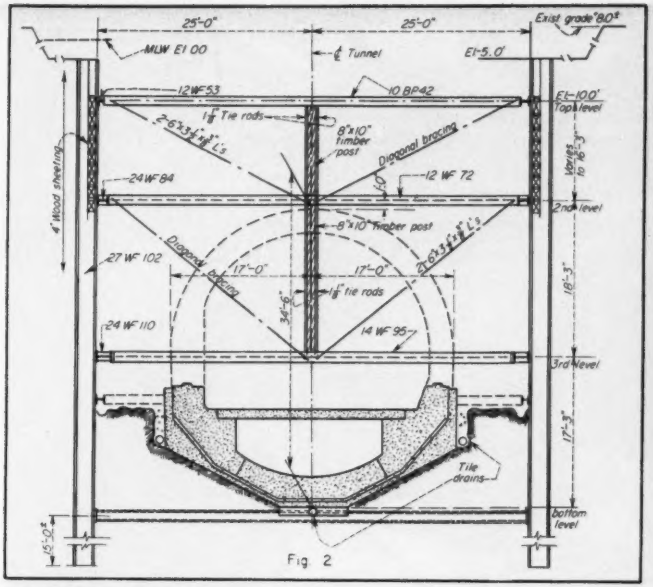
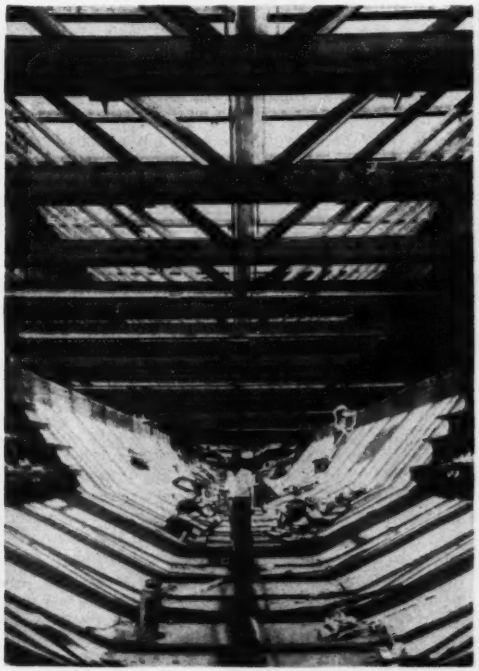


Fig. 2

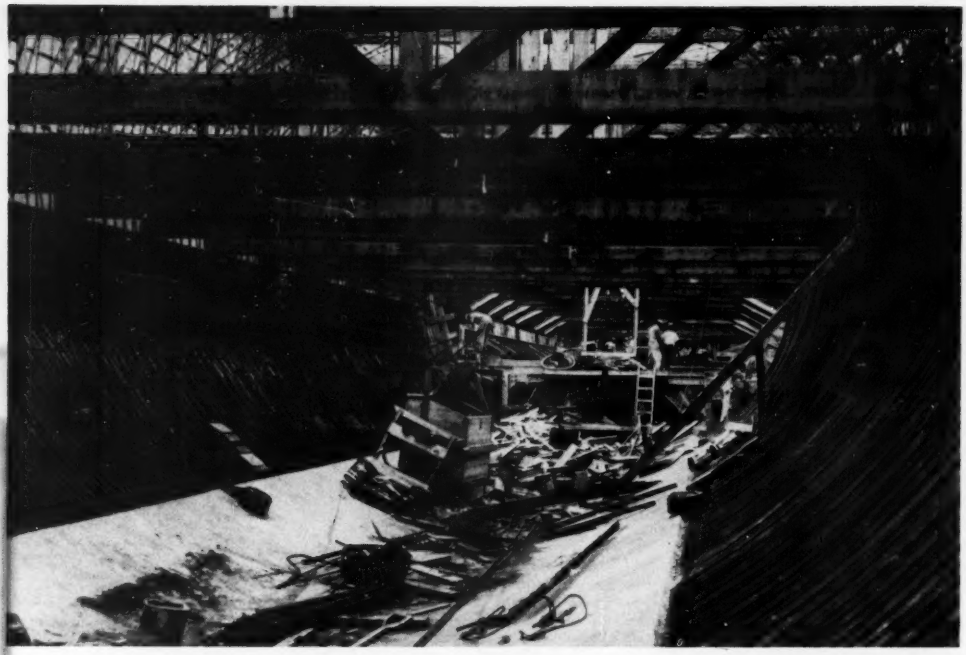
CROSS-SECTION through deeper end of cut shows bracing details. Struts beneath tunnel were eliminated, effecting great savings. Next higher level is removed after invert, haunches and roadway are poured and load transferred to concrete through stub beams.

CONTRACTOR directing tough cut-and-cover tunnel job is Harry E. Pagliaro, president of Sterling Foundations Inc., New York.

TUNNEL SUBGRADE is readied for 6-in. concrete slab pour that provides working base. Hand-trimmed slopes eliminate tamped backfill; tile drain in gravel floor keeps bottom extra dry.



FOUNDATION SADDLE and working base, poured directly on trimmed berm, will receive membrane waterproofing topped by 4-in. protective course before tunnel's structural concrete is poured.



INVERT, HAUNCH, AND SLAB POURS are all in the clear below lowest level of trench bracing—not even a center post has to be moved. Here, invert has been completed, and Blaw-Knox traveling steel forms are being set up to pour the haunches.

to 150 gpm) six of the wells were fitted with 2-in., 5-hp submersible pumps instead. In some instances, the well-head was rigged with a screen box to act as a surface sump also, draining water to the pump below for removal.

The fact that final bottom of excavation is 67 ft below mean high water justifies elaborate precautions to insure that all eight well pumps are kept operating. Although the wells are an outright purchase proposition, rather than rental, Layne's warehouse keeps on hand a duplicate set of pumps assigned for Sterling's exclusive use in case of breakdown. Also on standby, should electric power fail, are two gasoline-driven pumps and a 50-hp diesel generator. Actually, the pumps first installed have been running 24 hr per day since February without giving a minute's trouble.

While the wells were being installed, soldier piles were driven on 5-ft 3-in. centers along both sides of the cut. Most are a 27 WF 102 section up to 73 ft long, and all piles penetrate 15 ft below final subgrade.

Open horizontal sheeting spans between pile flanges. It totals 46,000 sq ft, and members are 4x6- or 4x8-in. gumwood with 2-in. vertical spacers made of waste ends trimmed from the timbers. Sheeting was carried down with the excavation, held behind the inner pile flanges by bent spikes. And here's a psychological touch that paid off for Sterling: each man placing and spiking sheeting was given his choice of style, size and weight of hammer. It took a fantastic number of different hammers to keep all the men happy, but it resulted in better work, higher output and reduced cost.

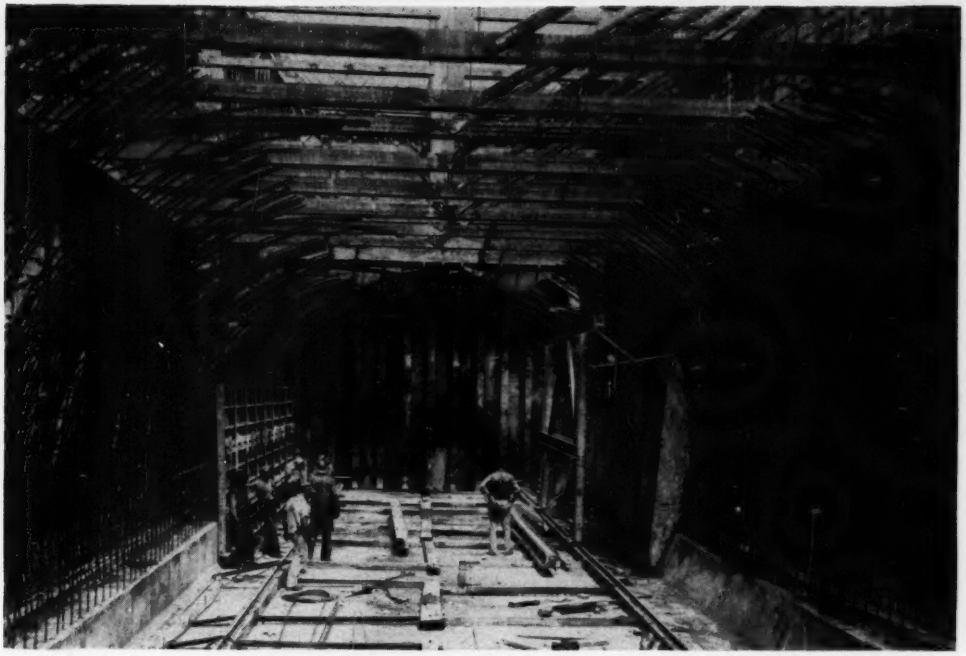
Excavation was generally handled by dragline and clamshell. Because the railroad bridge crosses the cut at 40 deg with longitudinal centerline, 6,000 cu yd of material beneath it had to be pulled to the clams by crescent scraper run by two-drum hoist. Layers of rock-like, impervious marl that had to be cut out with pneumatic chippers also complicated the work.

The cut was excavated over its entire area in 4- to 6-ft layers kept sloped toward the longitudinal centerline for drainage. Each layer was started at the deep end of the cut and was carried back on about the same slope as final subgrade. This facilitated setting wales (up to 24 WF 120s) and welded cross-lot bracing (up to 14 WF 103s), which also follow the same 5% slope as the tunnel to minimize interference with the structure as it is poured.

Either two or three levels of braces hold the cut, depending on its depth (*Fig* 2). Braces in each level are 10 ft 6 in. on centers, framing into the wales at alternate piles. Tierods, timber posts and angle diagonals brace them vertically.

Braces were set after wales were forced apart by a hydraulic jacking beam pumped to a 50-ton loading. Distance between jacked wales was measured, then the brace was cut to length and placed. This procedure eliminated the need for an estimated 1,500 steel wedges and, at the same time, prevented any bank movement whatsoever.

As mentioned, bracing is set parallel to the slope of the tunnel: the lower level always being higher than the tunnel bottom pours, the next level always above the arch pour. After invert, lower haunches and roadway slab are poured, load from the lower bracing can be transferred to the tunnel structure, with the road slab acting as a transverse beam. Removal of the unloaded lower level of bracing leaves the cut un-



ARCH POUR is also completely free of interference from bracing, which is next higher level than that shown in facing photo. Steel bulkhead carries sliding ring joint on far side for later connection of cut-and-cover section to precast tube section.

obstructed for the tunnel arch pour. All bracing will be removed as backfill rises around the completed structure, and soldier piles will be pulled, to salvage all 2,100 tons of steel that now hold the cut.

Original plans called for an additional level of cross-lot bracing. It was to be just below tunnel base, with a 14-in. 73-lb transverse beam at every pile. When material at that elevation turned out to be marl, this level of bracing was eliminated—Sterling carefully excavating the last few inches by hand, trimming the subgrade to exact tunnel elevation and section. This left undisturbed berms to hold the bottom of the cut without bracing. In addition to saving nearly 200 tons of precious steel (which would have had to remain permanently buried beneath the tunnel) the scheme saved the cost of excavating the additional material now left in the berms, saved the labor of placing the steel, and saved backfilling and tamping. Also, tunnel base concrete could be poured directly on the hand-trimmed undisturbed surface instead of on a 12-in. gravel layer that was originally specified over tamped backfill on the 1:2 sloping sides.

Sterling's tunnel concreting is now under way in the beautifully braced and surprisingly dry cut. Whatever surface water comes in—either from rain or from local seepage through ground filled with old timbers and other debris—is easily handled by open sumps at the lower end of the cut. A ditch along each side at the base of sheeting leads water to these, as do longitudinal 5-in. tile drains at edges and beneath the center of the tunnel base slab. As many as seven sump pumps are needed during heavy rains, but normally just two 2-in. units are sufficient to handle surface inflow. All pumps, both in wells and sumps, are cared for by a single operating engineer each shift.

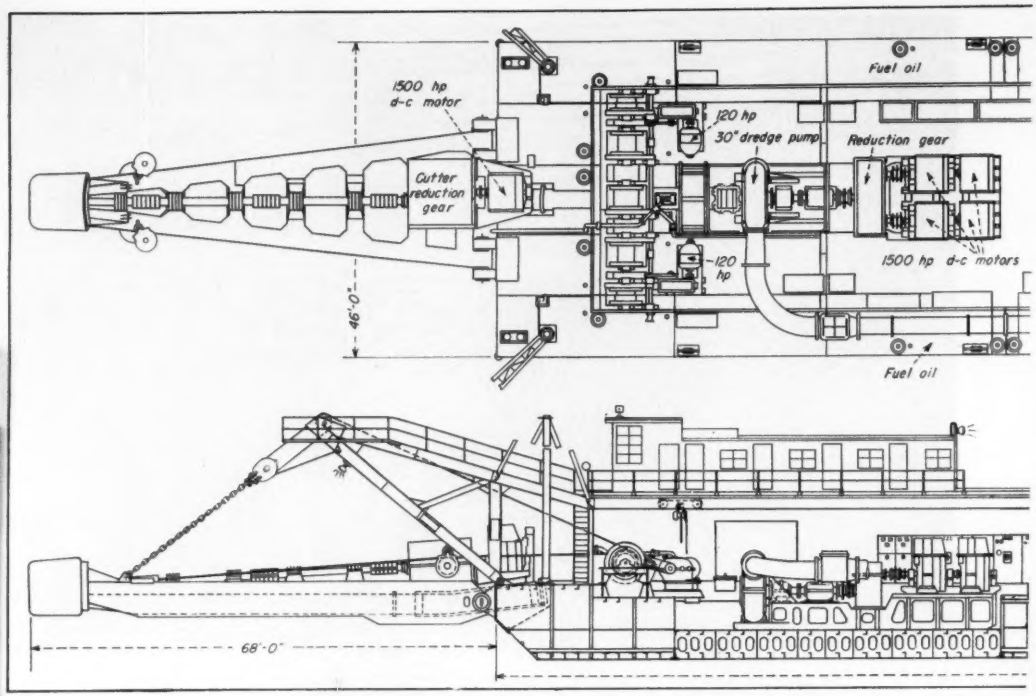
Harry E. Pagliaro, president of Sterling Foundations Inc., is directing his firm's difficult tunnel job in Portsmouth. William F. DeLeon is secretary-treasurer of the construction company and Joseph L. Rubin is vice-president. The general contractor for the 3,350-ft tunnel, Merritt-Chapman & Scott Corp., designed the sheeting and bracing system used by Sterling to support the cut for its 560-ft subcontracted section.

Money Talks—About Safety

"THE PAY CHECK you have received is our way of expressing our appreciation for a week's work, done safely. On this job, SAFETY IS EVERYBODY'S BUSINESS.

"Compare your check with one for $22. That is what you would have received for compensation if you had been hurt this last week. When an accident happens—everybody loses—but the fellow who is hurt loses most, both in pain and in money."

The foregoing is part of a safety reminder issued with pay checks by the contractor for Trenton Dam, in Nebraska. There is probably no more effective way of preaching safety than to point out how accidents put a dent in the pocketbook. And there's no better time than payday—every payday—to drive that safety message home. The threat of personal injury doesn't bother a man much—but a threat to his income is something he'll watch out for.



MOST OF *WESTERN CHIEF'S* machinery is mounted on main deck of sectional pontoon hull.

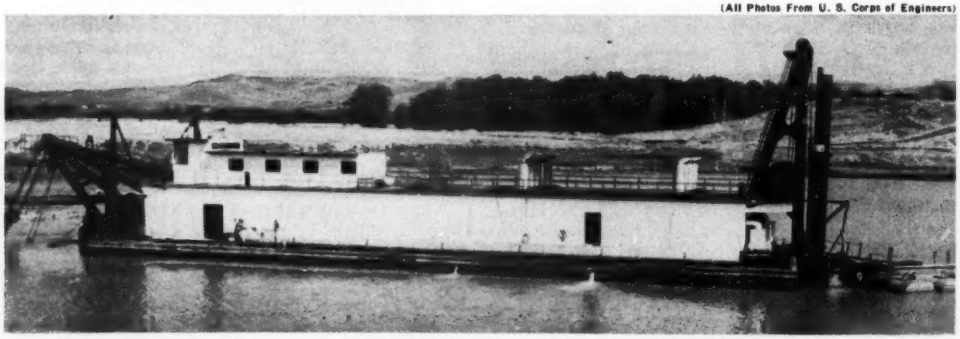
World's Most Powerful Dredge Built for Ft. Randall Dam

By HAROLD W. RICHARDSON, Editor

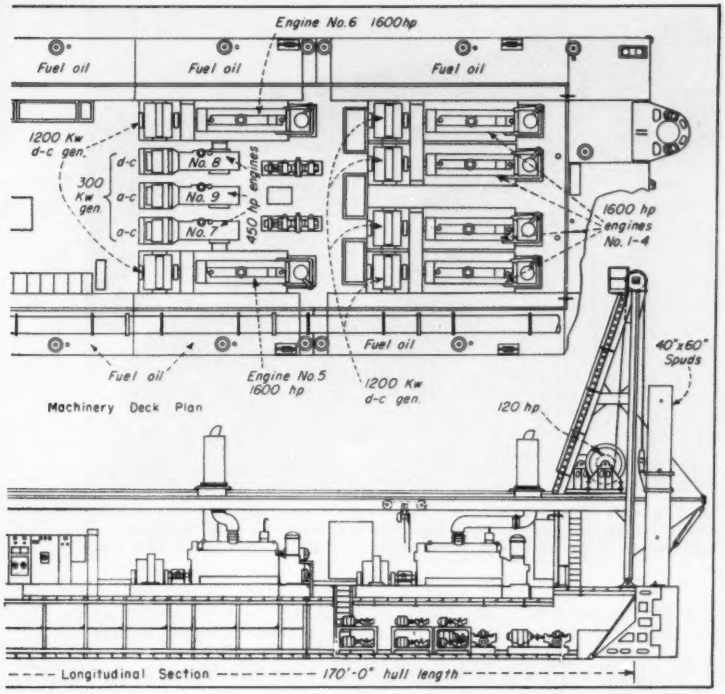
MAYBE YOU THINK the world's biggest suction dredge is on one of our ocean coastlines. Or perhaps it is on the Great Lakes, or out on one of our island possessions. Nope, it's the *Western Chief*, located amid the shale and chalk buttes on the Missouri River at Ft. Randall Dam in South Dakota, of all places!

She's a beautiful, trim craft sporting a 36-in. suction and a

(All Photos From U. S. Corps of Engineers)



HER 11,000 DIESEL HORSEPOWER makes the *Western Chief* the most powerful suction dredge of her type in the world. Here she is cutting her way up the combined outlet and spillway channel at Ft. Randall Dam on the Missouri River in South Dakota.



These sketches show arrangement of principal items and interconnection of power units.

30-in. discharge. But what makes her tops in the dredging world is 10,950 rippling diesel horsepower hooked to electric generators that, in turn, drive every operation through electric motors. On top of all that, she's a knock-down rig that can be dismantled and shipped to any part of the world in pieces for quick re-assembly.

The *Western Chief* is the brainchild and pride of Western Contracting Corp., of Sioux City, Ia. They hold contracts for some 18,000,000 cu yd of earthmoving at the U. S. Corps of Engineers, Ft. Randall Dam, of which 5,000,000 yd is good dredging material. She's the product of American industry, designed by Erickson Engineering Co. of Tampa, Fla., but built by numerous plants from coast to coast. Her cost? Probably close to 1½ million dollars. No contractor spends a million and a half for a plant to move 5 million yards of 25-c dirt, so the dredge certainly has a future far beyond that of her present Missouri River job. Even the U. S. Navy has become interested in her knock-down features, and you know the Navy is a top dredging outfit.

Besides her super-power, the *Western Chief's* greatest feature is her knock-down construction. All subassemblies are bolted together. They were shipped from plants all over the country by rail to the government yard at the job, then were transferred to trucks and lowboy trailers for haul to the erection site at riverbank. Heaviest piece in the dredge is the 125-ton ladder.

Principal structural features of the dredge are the hull, 46x170 ft, 11 ft deep, made up of 20 steel pontoons bolted together; a 68-ft ladder; basket-type cutter-head about 8x9 ft, designed to cut chalk rock; and two 40-in. spuds 60 ft long, weighing 32 tons each, sliding in 35-ton spud casings.

Diesel-Electric Power Plant

All power is electric, coming from six General Motors 16-278A 1,600-hp diesel engines driving Allis-Chalmers generators and three GM 8-268A 450-hp diesels, driving Westinghouse generators. Two of the small units produce ac current for auxiliary services, all other current is dc. Some of the power units are new, the rest were salvaged from surplus Navy DE craft.

The 30-in. main pump is recessed into the forward center pontoons. Its drive is most interesting. Four 1,500-hp dc motors are arranged

TWO TRACTORS pulling and three snubbing from the rear move 125-ton ladder from rail yards to river bank assembly site. This is heaviest section in the 2,000-ton dredge, designed as knock-down rig. Work was done in bitter cold winter weather.

MANUFACTURERS OF PRINCIPAL ITEMS

Darby Corp., Kansas City, Mo.: 20 pontoons for hull.

Union Steel Co., Los Angeles: 2 spud casings, 35-tons each; Main trunnions, 15 tons each; Ladder, 125 tons.

Consolidated Steel Co., Los Angeles: A-frame; Upper deck house; Lower deck house; floating 30-in. discharge pipe.

General Motors Diesel Div., Detroit: 6 1,600-hp diesel engines; 3 450-hp diesel engines.

Westinghouse Electric Corp., Pittsburgh: 5 1,500-hp motors; 3 150-hp motors; Electric panels; Controls; 30-ton reduction gear, main pump drive; Winding and spud reduction gears; 3 300-kw generators.

Electric Steel Co., Portland, Ore.: 30-in. main pump; 2 cutter heads (sand and rock).

Pacific Coast Engineering Co., San Francisco: Winding gear; Spud gear.

Western Gear Co., Los Angeles: 50-ton cutter head reduction gear.

Bethlehem Steel Co., Bethlehem, Pa.: 2 spuds, 40 in. x 60 ft, 32 tons each; Y-valves for land pipe.

Allis-Chalmers Mfg. Co., Milwaukee: 6 1,200-kw dc generators.

DREDGE TAKES FORM amid 20-in. ice in assembly slip. Here pontoons have been assembled into the hull, engines, generators, motors and main pump are on deck and lower housing has been started. In foreground are the two 32-ton casings that will take the 60-ft spuds.

in two sets of tandem drives, in other words, two motors are mounted on a single shaft. These two shafts are connected to a 30-ton Westinghouse reduction gear that, in turn, drives the pump through a 14-in. shaft fitted with Kingsbury thrust and spring bearings. Thus, any combination of motors, from one to four, can be cut into the pump drive as desired to handle the load on the pump.

The cutter head is powered by a 1,500-hp motor working through a 50-ton Western Gear Co. reduction gear driving a 14-in. shaft. This gear is mounted on the ladder just ahead of the motor.

The winding gear and ladder hoist work through clutches off a common shaft gear-connected to two 140-hp motors. This equipment is mounted on the forward end of the main deck. At the rear of the upper deck is a 120-hp motor driving the two spud hoists through gears and clutches.

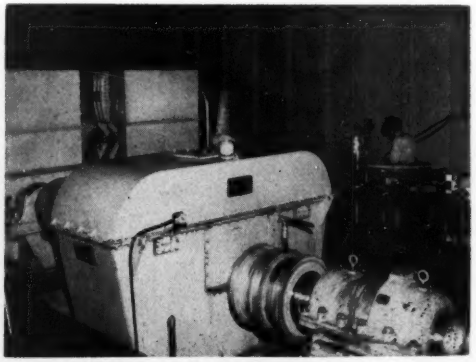
Auxiliary service units and pumps are permanently installed in some of the pontoons. Fuel and oil tanks are also in pontoon sections.

Pontoon tanks supporting the floating pipeline are 5x8x20 ft, made by Eaton Steel Corp., Omaha. Bethlehem Steel Co. made up some simple Y-valves with sliding gates for the shore line. Consolidated Steel Co., Los Angeles, made up the 30-in. floating pipe sections. Land pipe came from several sources.

The accompanying drawings

(Continued on page 58)

THREE MEN RESPONSIBLE for dredging operations at Ft. Randall are John Yasich (center), dredge superintendent for Western Contracting Corp., R. L. Fitzhugh (left), engineer on dredging and Ben Babb, resident engineer, respectively, for U. S. Corps of Engineers.



FLEXIBLE VARIATION of drive power of main pump is possible by clever arrangement of four 1,500 motors in two tandem pairs (extreme left) driving through this 30-ton Westinghouse reduction gear. Shaft at right, 14-in. dia, drives pump.

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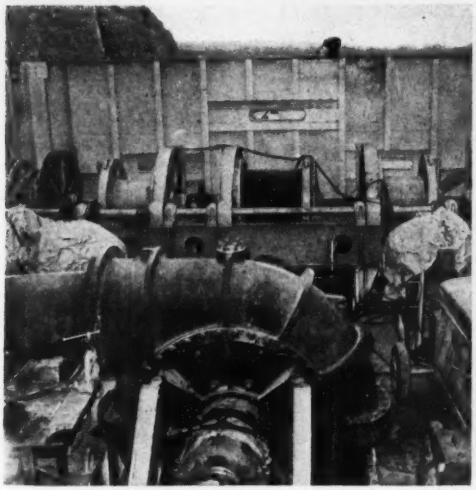
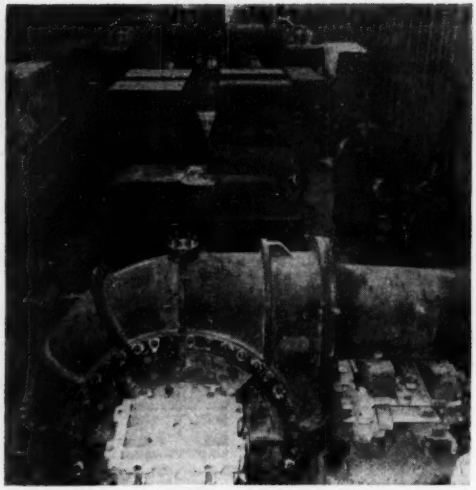




THE 30-IN. MAIN PUMP is recessed into pontoon section in front part of hull. Left view is looking forward with winding and ladder gear in background. At right, looking aft, pump is in front of reduction gear box. Behind it are two pairs of 1,500-hp drive motors set in tandem. In distance are the diesel-generator sets. Both of these are construction views.

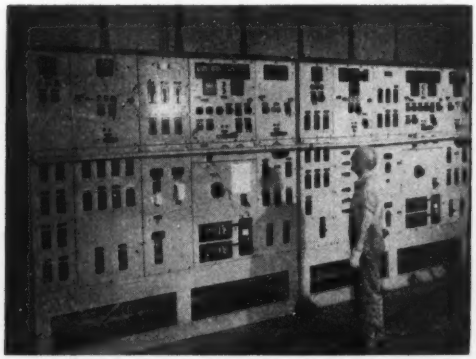
show the general arrangement of machinery units. The fact that the *Western Chief* was assembled from parts made all over the country is evident from the table giving manufacturers' names and locations. Principal features are also shown by the various photographs.

The dredge was assembled in bitter South Dakota winter weather that ran from zero to 20 below. Ice averaged 20 in. thick in the assembly slip. First hull section arrived on the job November 21, 1950. Erection started the next day, was completed April 21, 1951. On April 26 the *Western Chief* started digging in chalk rock. At first it was hoped she could dig the rock in place, but soon it was found necessary to loosen the rock by blasting to keep the blades on the cutter head. This situation increases the cost of material removal but the dredge still is doing a giant work.

A stiffleg derrick set up on the bank, assisted by crawler cranes, did the erection work. A 25-man crew—1 diesel engineer, 3 mechanics, 1 machinist, 5 welders, 2 crane operators, 2 riggers, 5 electricians, and 6 helpers—did the job by working 9-hr shifts 6 days a week.

Garland Everist is project manager for Western Contracting Corp., and John Yasich is dredging superintendent. John supplied us with the information on the dredge given in this article.

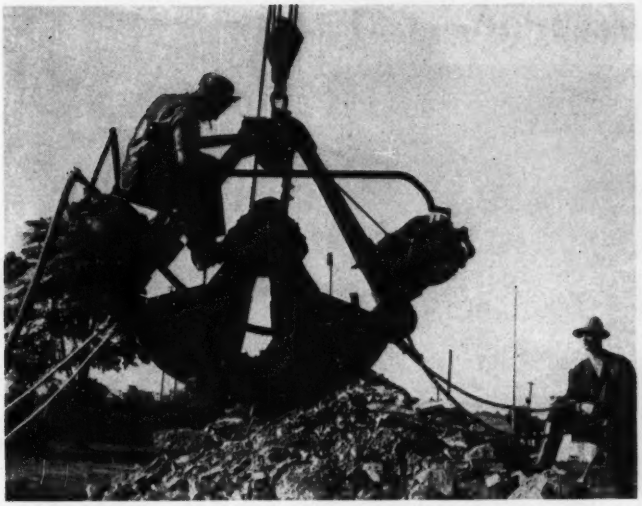
Ft. Randall Dam is being built by the U. S. Corps of Engineers, Omaha District, as a major project in the Pick-Sloan plan for development of the Missouri River Basin. Col. Henry Hoeffer is district engineer. George Evans is area engineer in charge at the job. Ben Babb is resident engineer on earthwork operations and R. L. Fitzhugh is engineer on dredging.



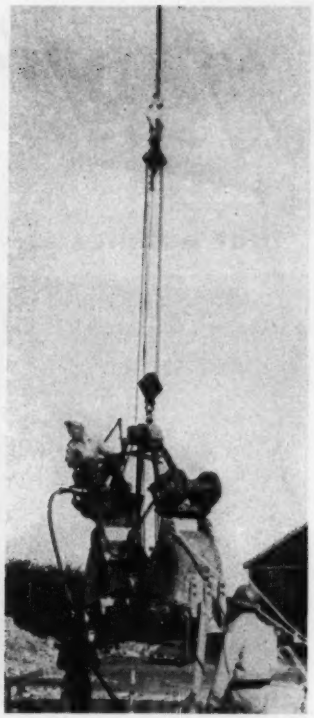
CONTROL PANEL BOARDS resembling those in big powerhouse are necessary to distribute 11,000 hp generated by the diesels. This is one of two similar panels. Dredge uses dc current for operation of pump, cutter and heavy drives, ac for auxiliary equipment.

A FLIP OF THE WRIST operates the big dredge through these simple controls. This is a lot different from the bank of long levers once found in the operating houses of old steam dredges. Electric drives for all components provide operational flexibility.

Air Motors Convert Clamshell Into Shaft Mucker



RIDE 'EM, COWBOY! Operator riding bosun's seat puts the JGSOMSPASMLM (see text) through demonstration paces on muck pile at top of Shaft 3 on big Ontario Hydro tunnel at Niagara Falls. Actually it's a clever job-made shaft muck loader, consisting of a clamshell bucket powered by two air hoists. And it works, too.



MUCKER hangs from crane hook or dogged-off line. One air hoist raises and lowers rig through multiple-part line; other hoist opens and closes bucket.

OPERATOR has to close and raise bucket in simultaneous operation. Here load is being hoisted to dumping position. One air line supplies both hoists.

ONE OF RUBE GOLDBERG'S nightmares might be a polite description of it, but really it is the Jess Glaeser Special One-Man Self-Powered Automatic Shaft Muck-Loading Machine.

Jess Glaeser, project manager for Perini-Walsh on the big Ontario Hydro tunnel job at Niagara Falls, Ont., got tired of seeing the gangs struggle to get the two shafts mucked out by hand. So he and his mechanical genii came up with this mechanized wonder.

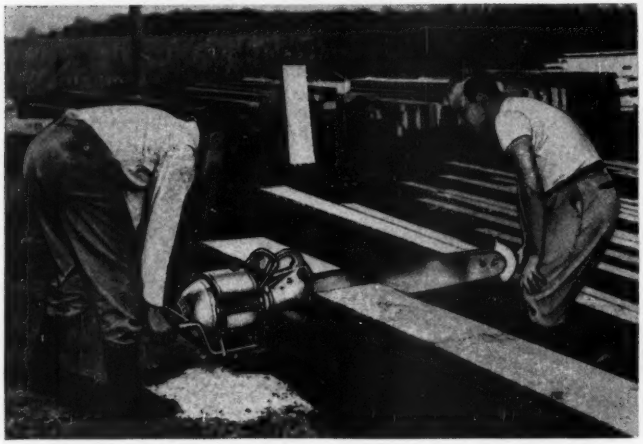
They simply attached two Ingersoll-Rand Tugger air hoists to the main frames of a clamshell bucket. Also they welded a strap-iron bosun's seat to one frame and extended the hoist throttles to within reach of the operator riding the seat.

The rig works like this. It hangs from a hook on the load lines of a crane or a hook on a fixed line dropped from the head frame, dogged off about 20 ft above bottom of shaft. One air hoist, operating through a multiple block line, raises and lowers the clamshell through a 20-ft range. The other hoist is rigged up to open and close the bucket. The operator, by dexterously manipulating the controls on both hoists, lowers the clamshell in open position over the muck, closes the bucket, and raises it to dumping level over a skip. Then the load is pulled over the skip for dumping by taglines hauled by hand. Release of the closure line dumps the bucket. It is then again spotted over the muck pile by the taglines.

(Continued on next page)

New! LIGHTWEIGHT 9 HP DISSTON INTERMEDIATE CHAIN SAW

that handles any woodcutting job!



Here's the power chain saw you've been waiting for—the new 9 hp, 2 cylinder Disston Intermediate Chain Saw, the DA-211. Powerful enough to handle any woodcutting job—yet its balanced light weight makes it easy to heft. It will give you many years of satisfying, trouble-free cutting power.

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SHAFT MUCKER . . . **Cont. from p. 59**

As might be well imagined, control of the mucker involves a nice coordination between lowering, closing and hoisting operations. Also, the air line to the hoists must be hung up clear of bucket operations. But the operators are becoming adept at running the rig, and it is working out even better than its originators expected. After all, it can't be too difficult to operate, for we saw Lou Perini himself do a fair job of digging out a bucketful of muck.

HOLDING the hoist line and releasing the closing line dumps bucket, just the same as on normal two-line clamshell operation. In the shaft, bucket is moved laterally by hand lines for dumping into skip.

The two shafts, 26 ft dia and about 300 ft deep, are for access to the Perini-Walsh contract for half of 5½ mi of 51-ft tunnel to serve the new Adam S. Beck Hydro Station No. 2, being built by the Hydro-Electric Commission of Ontario. Gordon Mitchell is project engineer on the job for Ontario Hydro.

Rains Force Equipment Sales

WET WEATHER this year put many contractors in the upper Mississippi Valley against the wall. To raise cash for running expenses and pay off borrowed money, 31 contractors from Minnesota, Wisconsin and the Dakotas recently pooled heavy equipment for a cooperative auction sale. Proceeds totaled $1,400,000.

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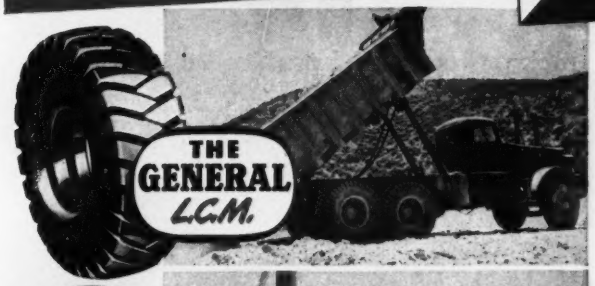

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For most work off the road, some on. Broad, deep lugs and thick, rugged shoulders prevent cuts, snags, bruises. More rayon cords, more rubber for extra carcass strength.

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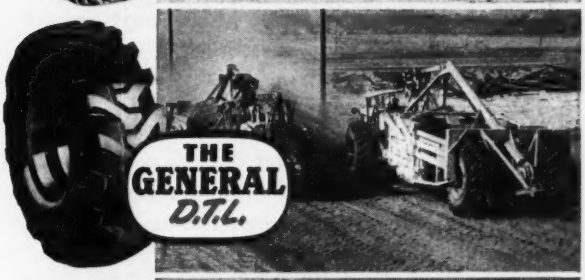

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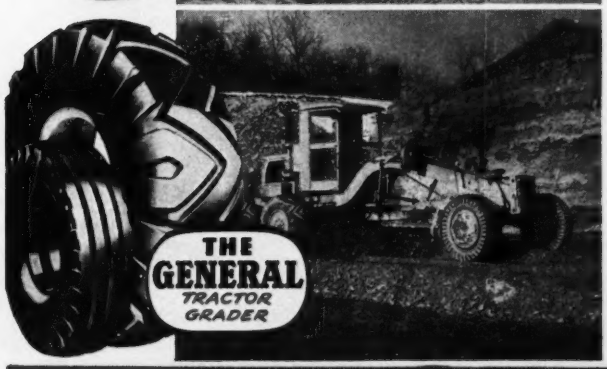
To move more yards of dirt, the General Dual Traction Lug digs deep for more traction in soft going, forward or backward. Makes heavy jobs easy.



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For power wheels—sharp, diagonal, self-cleaning tread bars for maximum traction, forward or backward. For front wheels—easy steering, smooth riding ribs.

SPECIFY GENERAL TIRES ON YOUR NEW EQUIPMENT

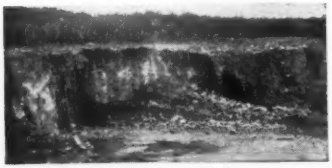
Just before the blast.

The holes begin to fire . . .

and the blast progresses . . .

across the face . . .

without spurts of wasted gas.



A well-shot pile!

Machine Gun Camera Tells the Story

Rockmaster *at work in Kingston Trap Rock Company Quarry, Kingston, N. J., proves blasting control whether your job is coal mining, stripping, quarrying or construction.*

Twelve holes eighty feet deep were loaded with 9028 pounds of explosives—Apex #4 MV and 75% Giant Gelatin. Spacing was twenty feet; burden eighteen feet. Because it was important to minimize noise and vibration, ROCKMASTER milli-second delay detonators Numbers 1 through 12 were detonated at the bottom of the holes.

The quarry operator reported that even though this was a larger blast than he normally fired, no complaints about noise or vibration were received. And the photos show that breakage was *good!*

Ask your Atlas representative to show you the picture presentation of the ROCKMASTER story. He will show you through the eye of the machine gun camera how *you* can profit by using the correct numbers of the *sixteen* ROCKMASTER milli-second delay detonators teamed with the ROCKMASTER system of explosives choice and loading methods.

ROCKMASTER: Reg. U. S. Pat. Off.

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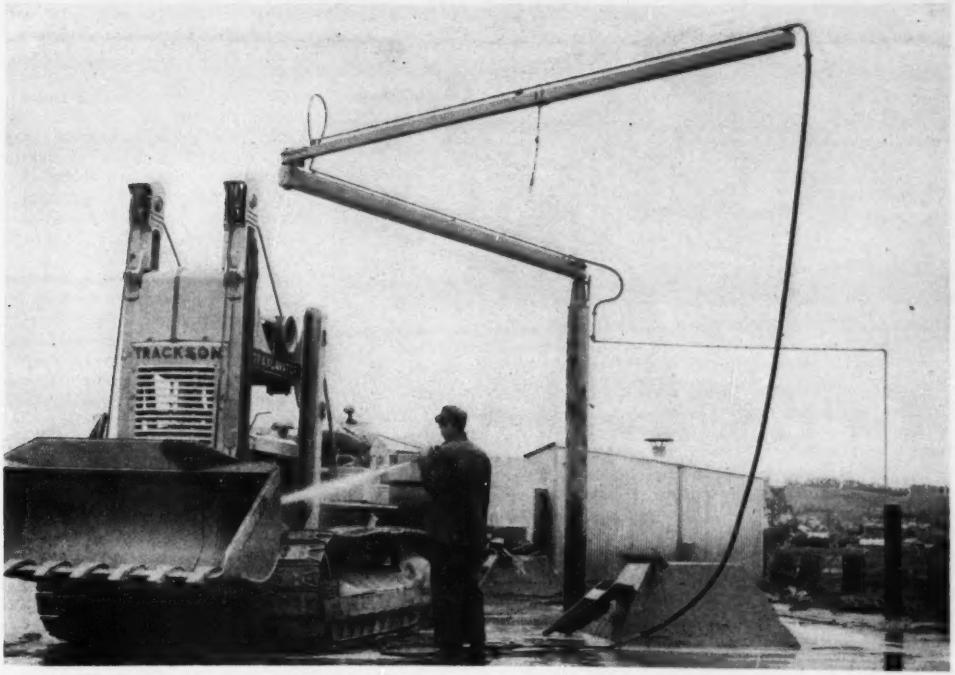
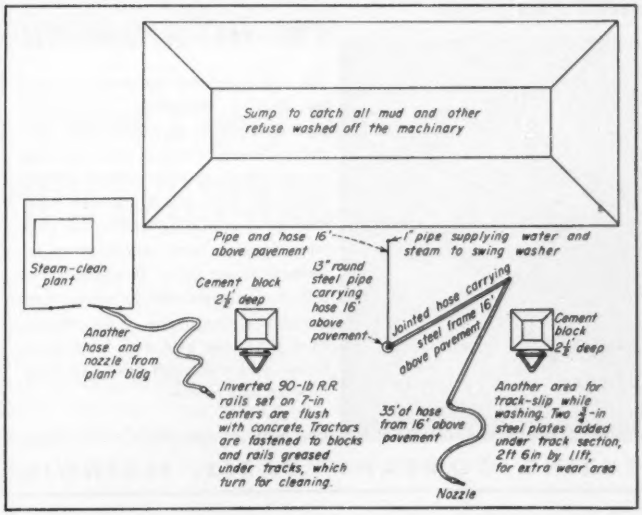


TRAXCAVATOR gets a bath with special installation of Peterson Tractor & Equipment Co., San Leandro, Calif. Concrete block anchors tractors as tracks rotate for cleaning. Shed in background houses steam cleaner. Sketch below shows layout details.

How to Make Effective Use of

STEAM CLEANING EQUIPMENT

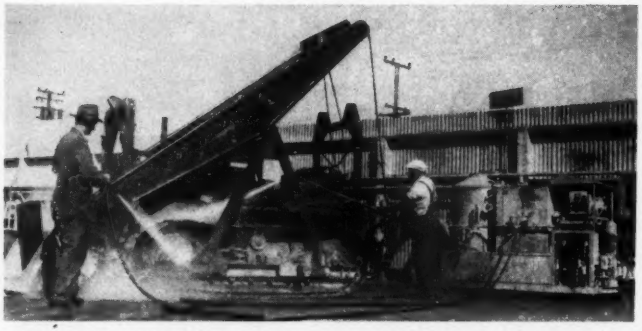

Sump to catch all mud and other refuse washed off the machinary
Steam-clean plant
Pipe and hose 16' above pavement
1" pipe supplying water and steam to swing washer
Cement block 2½' deep
13" round steel pipe carrying hose 16' above pavement
Jointed hose carrying steel frame 16' above pavement
Cement block 2½' deep
Another hose and nozzle from plant bldg
Inverted 90-lb R.R. rails set on 7-in centers are flush with concrete. Tractors are fastened to blocks and rails greased under tracks, which turn for cleaning.
35' of hose from 16' above pavement
Another area for track-slip while washing. Two ¾-in steel plates added under track section, 2ft 6in by 11ft, for extra wear area
Nozzle

By MICHAEL K. DUGENER
Malsbary Manufacturing Co.

STEAM CLEANING of construction equipment pays off in a number of ways. Studies show that one man with a steam gun can do as much maintenance cleaning in an hour as a man with a brush and bucket can do in 8 to 10 hr. Power cleaning cuts as much as 40% off repair time on engine and chassis overhauls.

It's a quick, easy way of preparing equipment for repainting, welding and repair. Steam cleaning exposes the metal so chassis and engines can be inspected thoroughly; thus troubles are located before they cause major breakdowns.

Regular steam cleaning also prolongs equipment life by removing



HIGH-PRESSURE COLD WATER and steam are used simultaneously for cleaning crawler and its shovel. Heavy-duty Malsbary steam cleaner in background furnishes both mediums for fast cleaning of heavy grime in the yard of Frederick & Watson, Oakland, Calif.

corrosive, abrasive mud, grease-impregnated dirt, and road oils from tracks and other wearing parts. Furthermore, clean equipment gets better treatment from operators.

•**How often**—Construction equipment should be steam cleaned at regular intervals, just as lubricating is done regularly. On wet, muddy jobs, once a week may not be too often; on dry, fairly clean jobs, once a quarter should be often enough.

However, few contractors have regular cleaning schedules. At Davis Dam, the Utah Construction Co. reconditioned Cummins diesel engines from Euclid trucks (CM&E July, 1949) at 1,000-hr operating intervals. These engines were stripped and all parts steam cleaned as the first step in reconditioning. V. N. Holderman & Sons of Columbus, Ohio, (CM&E April, 1949) completely overhauls and repaints all equipment during the winter months. First step is steam cleaning.

J. Henry Harris, paving and excavating contractor of Berkeley, Calif., keeps his mechanics busy during slack periods by having them steam clean any equipment that's in the yard. All equipment requiring major overhaul is first steam cleaned. Peterson Tractor & Equipment Co., San Leandro, Calif., steam cleans and repaints every piece of equipment brought in for a major overhaul. Vice-president R. A. Peterson says the mechanics like to work on a clean tractor.

Generally speaking, steam cleaning should be done often enough to spot wear before it becomes serious; and certainly, a thorough cleaning of tracks, chassis and engine is the first step in any major overhaul or repainting job.

•**What size**—Steam cleaners are divided into two general types: steam vapor cleaners, which depend on steam for their working pressures and have a practical operating limit of 75-100 psi; and

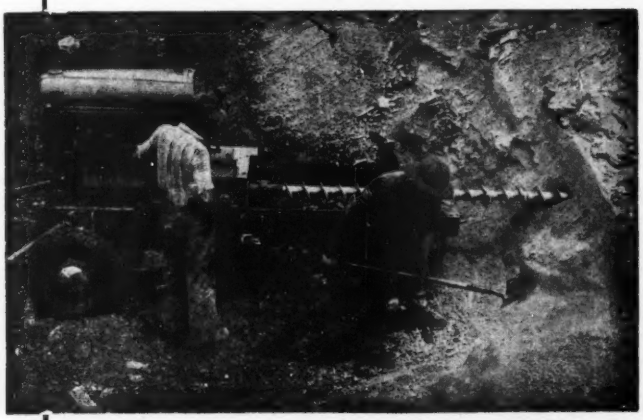
(Continued on page 66)

Parmanco

HI-SPEED HORIZONTAL

DRILLS

New Traction Drive with Forward and Reverse



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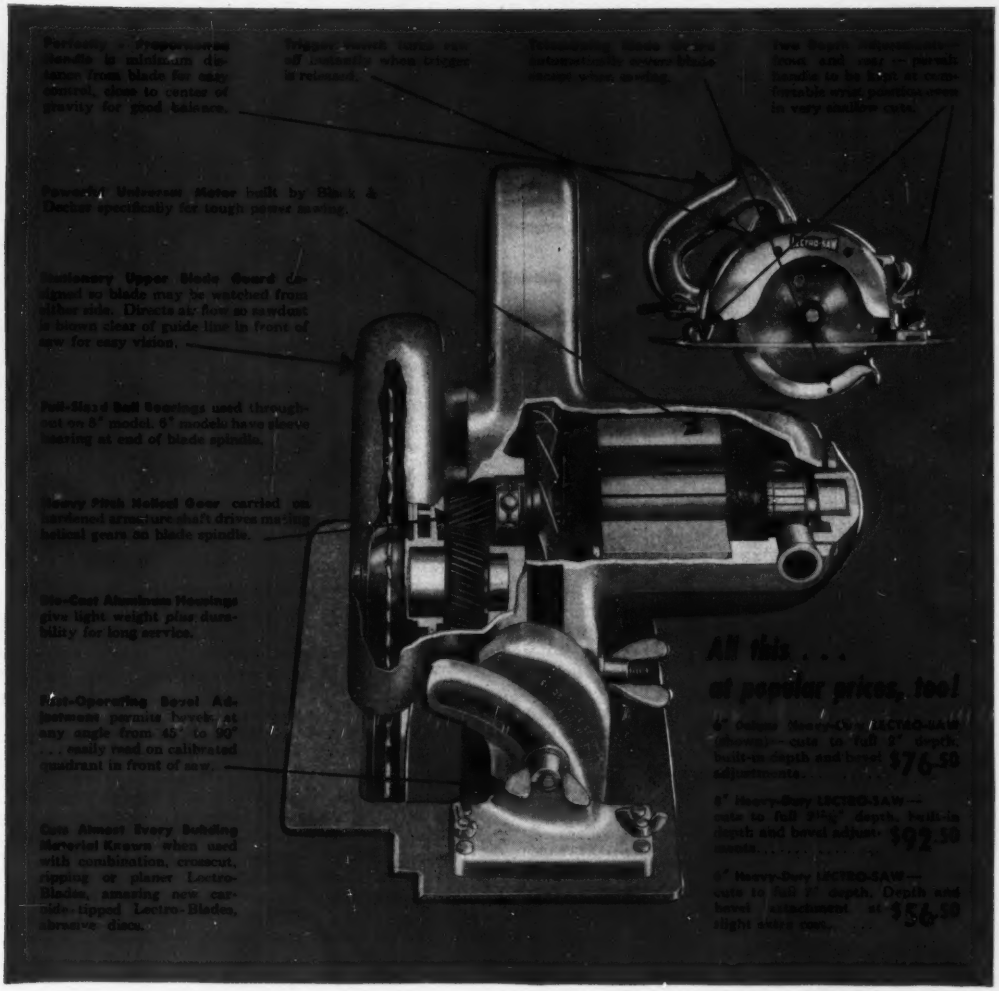

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RED END
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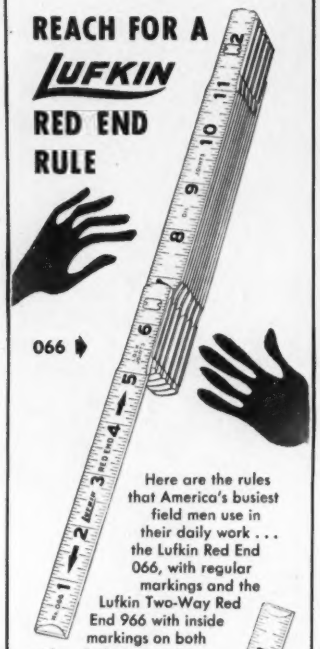

066

Here are the rules that America's busiest field men use in their daily work . . . the Lufkin Red End 066, with regular markings and the Lufkin Two-Way Red End 966 with inside markings on both sides. Both are tough, springy, built to take plenty of hard use. Jet black markings on white background stay easy-to-read. Look for and ask for Lufkin — the only folding wood rule with the bright red ends.

966

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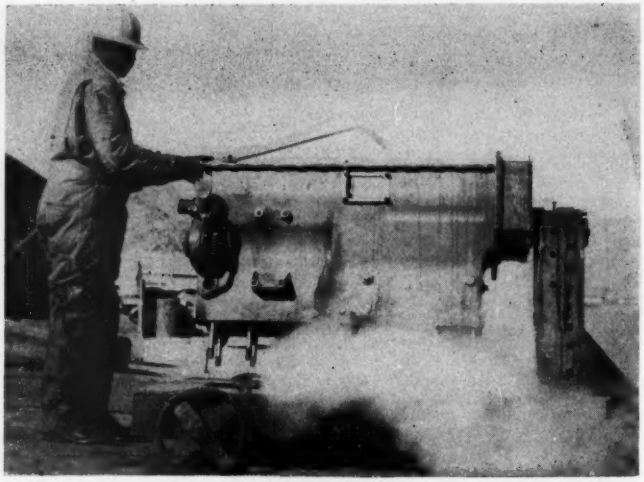

STEAM-CLEANING CUMMINS DIESEL ENGINE from a Euclid truck in course of 1,000-hr overhaul by Utah Construction Co., during construction of Davis Dam on Colorado River between Nevada and Arizona. As much as 40% in time is saved on overhaul by pre-cleaning.

heavy-duty, high-pressure steam cleaners, which depend on pumps for working pressures and are capable of delivering hot solutions at 400-lb pressure. Which to use will depend largely on the type and number of machines to be cleaned and where the work will be done.

Here's the rule of thumb Malsbary uses when making recommendations:

Clean with heavy-duty steam cleaners if you have: (a) many tracklayers; (b) lots of heavy cleaning, that is, tars, thick mud or greasy dirt; (c) work requiring one man all day long.

Clean with steam vapor models where: (a) you clean only intermittently and then for only 2 or 3 hr; (b) you have only 2 or 3 hr of cleaning every day; (c) you want a spare cleaner that's easily taken into the field for steam cleaning on emergency repair jobs.

Steam vapor cleaners cost less than the heavy-duty, high pressure models, but, because they require steam for pressure (limited to 75-100 psi), they have to be burning all the time cleaning is in progress. There are constant fuel costs and the machines are limited in cleaning actions to hot solution and vapor.

Heavy-duty steam cleaners, because they get pressure by means of a pump, are more versatile, can deliver cold water up to 400 psi; hot solution up to 325 deg F coil temperature; hot water up to 325 psi and 115-160 deg F; warm water at low pressure; and wet steam at low pressure. On many models two or more guns can be used simultaneously, one delivering high-pressure cold water, the other high-pressure hot solution. These heavy-duty cleaners have capacities ranging from 300 to 2,100 gph.

Cleaning construction equipment is much like washing grimy hands; the dirtier they are the more pressure, soap and water needed. Because heavy-duty models provide higher pressures and greater water or solution volume, they are used more generally for the tough cleaning needed on tractors, shovels, compressors and trucks.

• **Stationary vs portable** — If equipment is brought into a permanent yard for inspection and overhaul, a stationary, heavy-duty steam cleaner usually is recommended. Stationary models cost less, give better control of drainage and supplies. For emergency repairs in the field, or where cleaning is restricted to engines and engine parts, a portable steam vapor cleaner is usually handiest. However, if equipment is working for long periods on a job removed from the home yard, and major overhauls have to be handled there, a trailer-mounted, heavy-duty model appears to be the best bet.

• **Locating the cleaner**—Drainage is a problem in all steam cleaning, so a waterproof floor is almost a must. Concrete slabs are pre-

J. HENRY HARRIS, paving and excavating contractor of Berkeley, Calif., uses heavy-duty machine to remove road oil from a tank truck. Harris keeps mechanics busy during slack periods by cleaning any equipment that is in the yard.

ferred; asphalt or tar compounds quickly soften to a mush if exposed to hot cleaning solution. The blast from even a small steam cleaner can cut a hole through asphalt paving in a matter of minutes.

Steam cleaners also need protection from the elements, especially in sub-zero weather. Portable or trailer-mounted cleaners usually can be moved indoors when not in use, but stationary models should be protected by a shelter that is heated during cold weather, or drained nightly.

Peterson Tractor & Equipment Co. has a unique and efficient cleaning setup that is adaptable to most equipment yards. Its heavy-duty steam cleaner is housed in a shed adjacent to a large concrete slab. Water and solution are piped from the cleaner to an overhead jointed beam, 16 ft above the ground. The hose extends down from this beam and is easily moved around big equipment. This arrangement also reduces hose wear due to dragging. A counter-balanced arm can be used for the same purpose.

When tracklayers are being steam cleaned, Peterson anchors them to a concrete block and slowly rotates the tracks, so that all the track plates and links are reached by the hot cleaning solution.

• **Cleaning hints**—Each operator has his own pet cleaning methods, but in general the following is recommended practice for heavy-duty cleaning:

USE	CLEANING ACTION
For quickly removing stubborn deposits of grease, road oils, tar.	High-pressure steam cleaning, 150-200 lb pressure and up to 325 deg F coil temperature.
For removing common dirt, mud and clay.	High-pressure cold water to 400 lb, and 5 to 15 gpm.
Where mud and dirt are impregnated with oil and grease or where there are light deposits of grease and oil; also for quick de-icing.	High-pressure hot water to 400 lb, and 5 to 10 gpm.
For hand washing trucks and equipment.	Low pressure warm water, 3 to 15 gpm at 120-200 deg F.
For de-gassing tanks; heating asphalt tanks, cleaning asphalt tanks; for sterilizing purposes.	Straight steam, 15 to 30 boiler-hp.

(Continued on next page)

Contractor H. H. Auch Reports...

• "We are happy to report . . . that the David White Universal Level Transit has our wholehearted approval."

GEO. W. AUCH COMPANY
BUILDERS

Mr. E. G. Locke, Sales Manager,
David White Company,
315 W. Court Street,
Milwaukee 12, Wisconsin.

Dear Mr. Locke:

It is with pleasure that I write you regarding the performance of our new David White Universal Level Transit, Serial #58114.

The ease and speed with which it is set up and the accuracy of the readings taken most certainly belie its actual cost. The level has been on our largest job since it arrived and the Superintendent of the job prefers to use this David White in preference to a [illegible] which requires much more "set up" time; and hence, for the ordinary shots is not near as popular on the job. We are happy to report to you that this David White Universal Transit Level has our wholehearted approval.

Very truly yours,
GEO. W. AUCH COMPANY
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THIS SIDE FOR 15-INCH SLAB
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WRITE FOR HELTZEL BULLETIN K-19

HELTZEL

STEEL FORM & IRON CO.

WARREN, OHIO

STEAM CLEANING . . . Continued

Time and compound will be saved and the best results obtained if advantage is taken of all the cleaning actions available on a cleaner, using each according to condition of the machine and the kind of cleaning under way. Here, though, are some of the methods others use.

Peterson Tractor pre-soaks dirt and grease with a diesel oil emulsion spray. This loosens the dirt so it usually can be blasted off by high-pressure hot water alone. Thus, both chemical and time are saved. It's easier on paint, too.

Frederickson & Watson, Oakland, Calif. contractors, use high-pressure cold water to wash off loose dirt and mud; then finish with high-pressure hot solution to dissolve oil-caked mud and grease.

To strip paint down to the metal, most operators first spray or wash the painted surface with a paint stripper. They wait a few minutes for the paint to peel up and wrinkle, then wash off with hot solution from the steam cleaner.

Care Keeps Hydraulic Systems on the Job

MANUFACTURERS of hydraulic systems point out that one of the best aids in keeping their products in good working condition is to maintain the correct fluid level, with the type of oil recommended and of proper viscosity. A full system is less likely to draw in air, and there should be no tendency for the fluid to foam.

Since the oil used in these systems also is the lubricant for pumps and other working parts, foreign matter must be kept out to prevent rapid wear and shortening of the life of seals and packings.

A checklist for maintenance personnel would follow these lines:

(1) Use proper type and viscosity oils; (2) Check oil level periodically and keep system filled; (3) Drain and refill system at intervals recommended; (4) See that connections and other parts of the system are kept in good condition, to avoid leaks; (5) Take special care in the handling and storage of hydraulic oils to keep out dirt. Use clean containers and filter oil before filling system; (6) On open systems, keep air breathers from clogging. Service breathers whenever air cleaners are serviced.

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PINE FLAT DAM... Circulated Air, Ice

BATCHING PLANT and rescreen tower with conveyor for aggregate. Rescreen tower is on separate structure to minimize vibrations in batch plant. Aggregate and cement are air-cooled before batching, with air coming from the cooling plant through the four horizontal ducts. Used air is collected at top of bins and returned via large vertical duct for re-use.

Part II—Aggregate and Batch Cooling

By L. L. WISE, Associate Editor

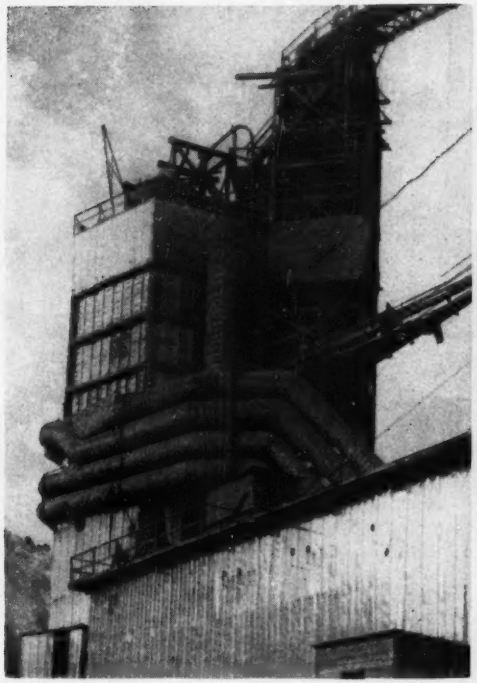
SPIRAL VANES of rugged cement cooler are seen in view of unit arriving at job. When cement arrived at higher temperatures than anticipated, an additional cooler was installed.

AT PINE FLAT DAM the contractor (joint venture of Pine Flat Contractors) has to meet one of the toughest cooling requirements yet dreamed up by engineers. All of the 2,200,000 cu yd of concrete must go into the dam at less than 50 deg F. For practical purposes, this means that it must leave the mixer at about 47 deg F. Weather conditions at Pine Flat make it particularly tough to meet this requirement. Summer temperatures regularly exceed 100 deg F.

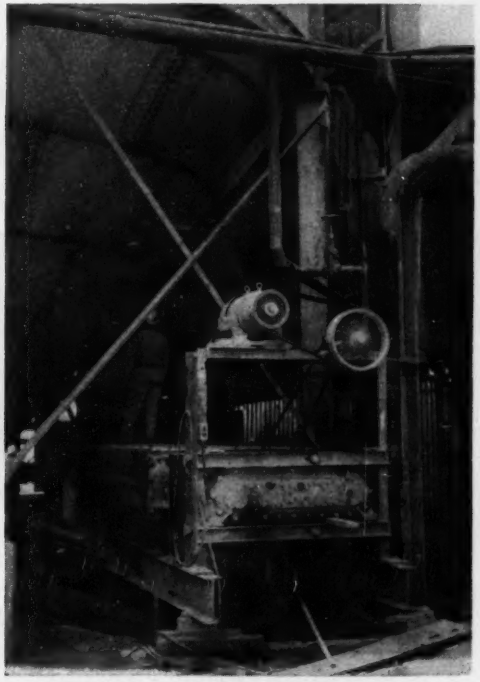
The mix is cooled by combining three basic methods: (1) air cooling of stone, (2) adding ice and/or refrigerated water to the mix, and (3) spiral-flow, heat exchanger cement cooling.

Cooling the stone follows methods previously used at Harlan County Dam on the Republican River in Nebraska (CM&E, June 1950, page 52). The four principal sizes of rock aggregate are stored

and Heat Exchanger Do Cooling



COOLING PLANT to meet 50 deg F maximum requirement is fully insulated and covered with aluminum sheeting. Air ducts are encased in aluminum foil to reflect heat of the atmosphere.



CEMENT COOLER of the spiral-flow type operates at the base of cement silo. Three of these machines are in constant operation to cool material from about 185 deg to 110 deg.

in bins at the batch plant and cooled air is blown through the bins from the bottom up. The air then is collected in a common chamber above the bins and returned for re-use.

Refrigeration for air cooling is developed by four Vilter ammonia compressors. Product of these units is pumped through coils in a water tank to reduce the water temperature to 34 deg F. Joy fans pull air through cold water spray and then through the aggregate bins. Each bin holds 250 tons of material.

On a typical 99-deg day this cools aggregate as follows: No. 4-¾ in. to 66 deg, ¾-1½ in. to 63 deg, 1½-3 in. to 51 deg, and 3-6 in. to 47 deg F.

Ice is manufactured by three Vogt tube ice machines that produce 180 tons of ice a day. A 4-cu yd batch of concrete requires as much as 350 lb of ice. Maximum production of concrete using this much ice has been 136 cu yd in an hour.

Cement cooling has proved to be a bigger problem at Pine Flat than originally anticipated. That's because instead of getting cement at 150 deg F or less, it has reached the job in the neighborhood of 185 deg.

The original setup involved a spiral-flow, heat exchanger cooler, as manufactured by the J. D. Christian Co. of San Francisco, at the bottom of each of the two cement silos. Cement from the first silo was cooled and passed to the second silo. The cooler at the base of the second silo would continually recirculate cement from bottom to top.

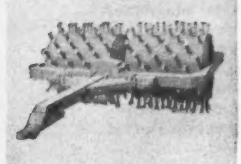
However, it was found that this wasn't enough to bring the cement down to the necessary 110 deg F. Accordingly, an additional spiral-flow cooler is being installed, positioned to operate with material from either silo.

Besides that, a cooling tower is being built at the cement silo setup. It was found that taking water from the refrigeration plant proved too much of a drain on available cool water. The cooling tower will reduce water temperature to, say, 65 deg F, which is ample for the purpose intended.

The batch plant is a fully automatic model CA-1750 Noble batcher with mixing accomplished in four 4-cu yd Smith mixers.

* * *

• This article on construction methods employed at Pine Flat Dam, on the Kings River in California, is being published in three parts. Part I, dealing with the greatest innovation—a fast cableway—appeared in the October issue. Part III will trace the production and delivery of aggregate. Look for it in the December issue of CM&E.—The Editor



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HD-15	109 drawbar hp. 27,850 lb.
HD-20	175 net engine hp. 41,000 lb.

Hydraulic Torque Converter Drive

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11. How to Choose the Proper Size Excavator

By E. O. MARTINSON Vice-President, Engineering, Koehring Co., Milwaukee, Wis.

WHERE AN EARTHMOVING JOB indicates the use of a shovel, hoe, dragline or clamshell, the contractor soon discovers that many factors enter into the determination of the proper size machine for the job. Selection of the most suitable excavator generally is conditioned by three main considerations: cost per cu yd handled; job conditions; and economic conditions.

In addition, the purchaser has to decide on the type of attachments that seem to fit the situation best. A subsequent article will discuss operating and cost determination methods.

•Cost per cu yd handled is influenced by:

(1)Total yardage; large jobs justify investment in larger machines.

(2)Price, weight and freight charges on machine.

This article, the eleventh consecutive one on fundamental principles of earthmoving, is sponsored by the Power Crane and Shovel Association.

(3)Depreciation, taxes, repairs, maintenance costs and resale value after the job is completed.

(4)Class of material, type of operations, theoretical hourly excavator output and job-operating factors.

(5)Wages for operator, oiler, mechanic and supervisor (lower per yd for large machines).

•Job conditions bear heavily in determining size of excavator needed due to:

(1)Operating range. Long reach or high lifts require larger machines, even though cost considerations may not justify the use of large equipment.

(2)Type of material to be handled.

(a) Dipper or bucket size. Large size dippers permit handling larger sizes of rock. Heavy clamshell and dragline buckets are required to bite into harder materials.

(b) Digging force available at tooth point is roughly proportional to size of machine; large machine will dig harder and tougher materials.

(3)Time allowable. High hourly capacity may be required to meet time schedules, or permit faster loading of trucks or rail cars, or faster unloading of barges, to reduce the number of these units required on job.

(4)Type of work.

(a) Quarry work indicates larger shovels.

(b) Drainage work usually calls for draglines, size depending upon size of ditch or canal and reach necessary.

(c) Stockpiling and bin loading are handled best by clamshells, the more permanent operations going to larger sizes.

(d) General contracting re-

quires the variety of attachments named above, plus the hoe and pile-driver attachments with machines in the smaller size ranges, such as ⅜, ½ and ¾ yd.

(5)Hauling unit size: Availability of small trucks may suggest small shovels.

(6)Transporting: State weight regulations may limit sizes for highway transportation. Over-all dimensions may limit rail transportation on larger sizes. Necessity of partial dis-assembly of large units for frequent moves would favor smaller machines which can be moved without dis-assembly.

• **Economic conditions** may be a deciding factor on size because:

(1)Available capital may make price and freight charges a first consideration, regardless of cost per cu yd or job conditions.

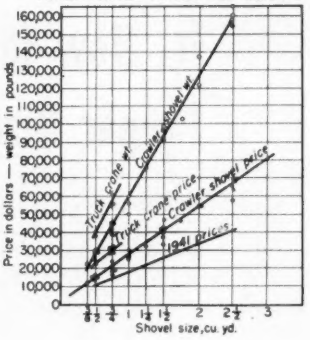
(2) Uncertainty as to total yardage requires investment caution.

(3)Availability of new or used machines depends on general economic conditions and the supply to manufacturers of materials, manpower, machine tools and plants for the building of excavators. Shortage of new machines means more demand for used machines and higher prices of used equipment, resulting in better prospects for resale at the end of the job. This makes the large machine a safer investment on the relatively short job, due to its lower operating cost per yd and less chance of heavy depreciation.

• **Excavator price and weight:** Manufacturers generally rate their machines in terms of shovel dipper capacity. Weight and prices among manufacturers for each of the sizes will vary somewhat. Fig. 1 shows the range of 1951 prices and weights taken from the current price lists of several manufacturers. Prices are for standard shovels, crawler-mounted, diesel engine-powered, complete with shovel dipper, fob the factory.

Cranes, draglines and clamshell machines without buckets run 10 to 12% less than shovels, but, for simplicity, only shovels are shown on the price chart. Hoes complete with dipper are about the same price as shovels.

FIG. 1
POWER SHOVEL PRICES AND WEIGHTS



Gasoline engines, instead of diesel, would reduce the price another 7 to 12% on the ½- and ¾-yd sizes, but not as much as that on the larger sizes. Diesels are used on 95% of the larger excavators. Some lift cranes use gasoline engines. Truck-mounted shovels in the ½- and ¾-yd ranges are shown on the chart in Fig. 1 for comparison with crawler cranes.

The chart of the average weight of shovels can be used in determining transportation methods. For purposes of estimating how much a machine must be dismantled for transporting by highway trailer, the following percentages may be

(Text continued on page 78)

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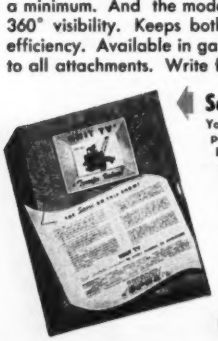

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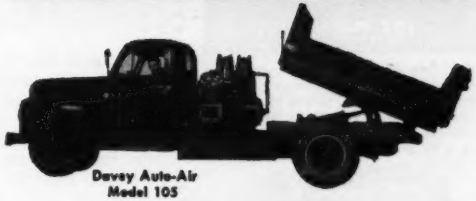

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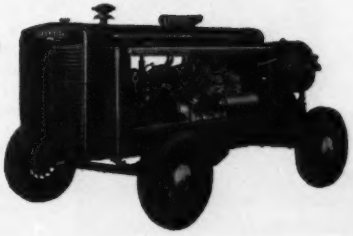

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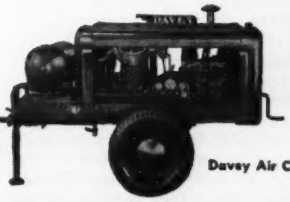

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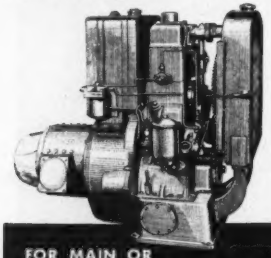

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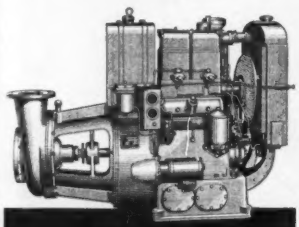

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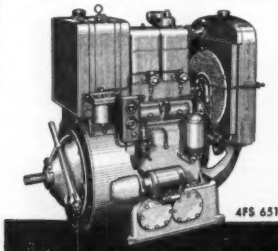

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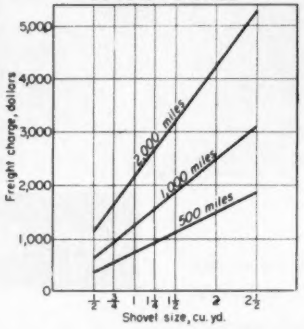
(Continued from page 76)

used on larger machines in the ⅜- to 2½-yd range.

Component:	*% of Total Shovel Operating Weight*
Shovel boom, stick and dipper	16 to 18%
Upper rotating assembly, not including booms	43 to 50%
Lower carbody, crawler frames and crawler shoes	32 to 37%
Basic length crane boom for draglines, etc.	4 to 6%

Freight charges depend on whether the machine is loaded on one or two cars (large machines), weight, distance and territory. Fig. 2 shows estimated freight charges for power shovels of the weights

FIG. 2 ESTIMATED R.R. FREIGHT CHARGES ON POWER SHOVELS



shown in Fig. 1 for 500, 1,000 and 2,000 mi distance. Railroad freight rates are based on new rates in effect Aug. 28, 1951. Even though approximate, the chart serves as a rapid means for estimating freight charges. Rates should be checked with the local freight agent if budgets are close.

• **Capacity of excavator:** The capacity of an excavator is of prime consideration in making a selection of machine size. There are several capacity factors to consider:

(1) Shovel dipper rating. Machine size usually is based on shovel dipper capacity. This is a trade custom which has developed because most early excavators were shovels. All the charts in this article use shovel dipper size as the basis for machine rating. Dipper rating is the struck capacity of the shovel dipper. Shovel dipper reach and lift may be estimated from Fig. 3.

For clarity, only four sizes are shown, but others can be estimated. The chart shows the relative proportions of the shovel dippers and digging range. The relative tooth digging forces at the tooth of a fully loaded bucket also are indicated pictorially by the length of the force lines drawn at the tooth point.

It is seen, for example, that while the 2½-yd shovel reach and lift is about 60% more than that of the ½-yd unit, its digging force at the tooth point is three times as great. Thus, the larger machine will rip out harder material and with less strain on the machine.

(2) Crane lifting capacity. This may vary somewhat among manufacturers for a given shovel size rating, depending on weight of the machine, weight distribution, crawler length, crawler spacing and length of boom. Fig. 4 shows typical crane-lifting capacities for various shovel ratings, but with the larger counterweights and longer and wider crawler spacing than for the standard shovel, because cranes and draglines usually are so equipped.

Shovels use smaller crawlers so as not to interfere with the dipper action. Rated crane lifting capacity is based on 75% of actual tipping load. Multiple-part hoist lines must be used to carry the heavier loads at short radius because the tipping capacity is greater than the single-line pull.

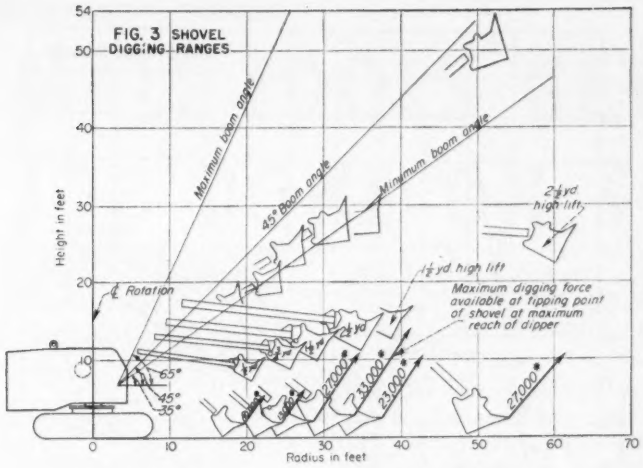
The crawler lift-crane range diagram, Fig. 5, shows graphically the height of the boom point above the ground and the radius or reach from the center of the crane for all sizes of cranes, for all boom lengths and for safe operating angles of boom elevation.

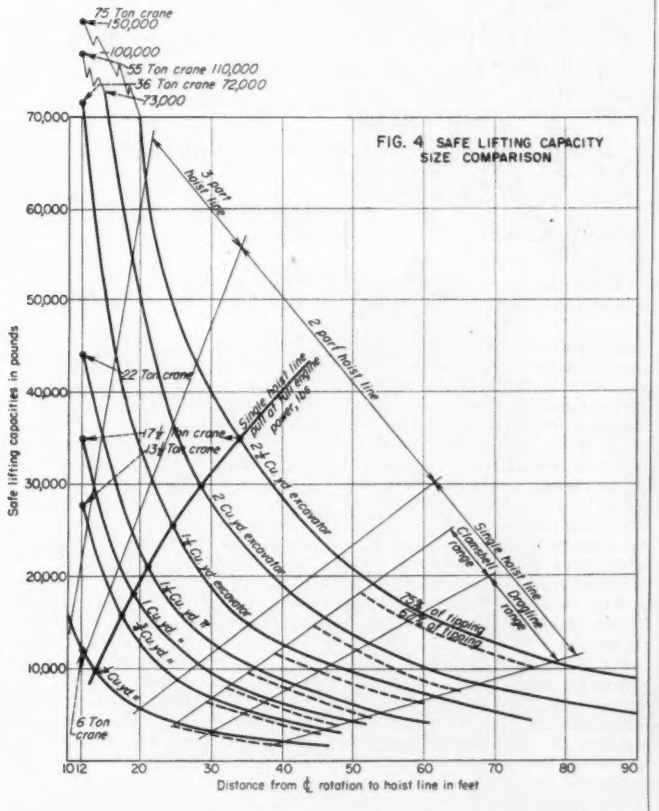
All of the combinations of boom lengths usually available for crane service in each of the six sizes are plotted. The lengths of the boom jib extensions generally available also are plotted on this chart.

For example, a ¾-cu yd crawler crane basic boom is shown to be 35 ft long, with extensions available in 5-ft increments up to 60 ft. Truck cranes in the ¾-yd size have different boom lengths, 30 to 90 ft.

Thus, if a lift must be made to a height of say 30 ft, plus 10 ft for slings, for a total height to boom point of 40 ft and a reach of 30 ft, the chart indicates a boom 42 ft long. This requires going to the standard 45-ft boom length, working at an angle of around 55 deg above horizontal.

The group of lines and circles on the lower center of the chart shows the recommended practical boom lengths for dragline service, which will be explained in greater detail under "Draglines". Range of the





usual boom angles used in the operation of lift cranes, clamshell buckets and dragline buckets is indicated. Clams may operate with higher boom angles when necessary, but more care then must be used in swinging the machine.

Boom lengths should be kept as short as possible to gain maximum lifting capacity and greater safety; to use less power to swing the machine; and cause less heating and

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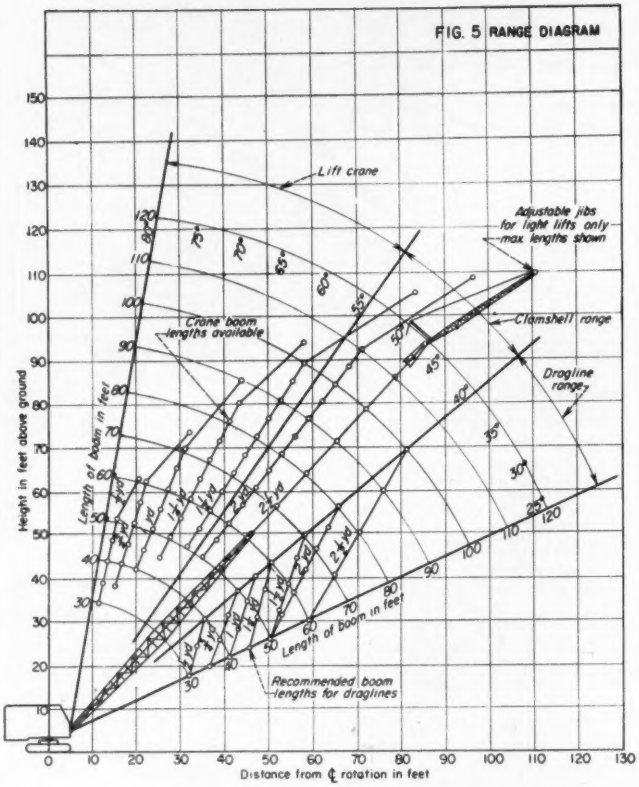
FIG. 5 RANGE DIAGRAM
Lift crane
Adjustable jibs for light lifts only—max. lengths shown
Crane boom lengths available
Clamshell range
Dragline range
Recommended boom lengths for draglines
Length of boom in feet
Height in feet above ground
Distance from ℄ rotation in feet

wear of the swing clutches. After the radius or reach is determined, Fig. 4 will show the safe crane lifting capacity, based on 75% of the load required to tip the machine in its least stable direction, which is usually over the side.

The crane thus has a safety factor of an additional one-third of the rated load on tipping to allow for imperfect footing or swaying of the load or crane boom. Truck- or wheel-mounted cranes are rated at 85% of actual tipping load for lifting on either tires or on outriggers.

Fig. 4 shows a typical tonnage rating for each of the shovel ratings shown. The tonnage rating of a crane is taken as its safe lifting capacity at 12-ft radius. For example, a ¾-yd crawler-mounted excavator may be said to have a crane rating of 13½ tons when equipped with its heaviest standard counterweight and longest and widest standard crawler spacing.

The number of parts of hoisting line shown on the chart represent merely suggested values, because heavier loads than shown for a single part line may be lifted at full engine power. But it is desirable not to use full engine power in hoisting, in order to leave power to accelerate and swing the load.

There is better control of hoisting when, say, not more than one-half to two-thirds of the full engine power is required to maintain hoisting speed. Of course, occasional lifts may approach the maximum line pull if care is used.

The larger machines show, by comparison, much greater capacities and ranges than their comparative shovel ratings would indicate. The chart shows, for example, that at 40-ft radius a 1½-yd machine lifts more than six times as much as the ½-yd unit and 2½ times as much as a ¾-yd size.

• • •

NOTE—Pumps of various types and capacities are valuable equipment when a contractor needs them. Often their use is intermittent, which can lead to neglect maintenance-wise. A good plan is to include pumping equipment on a regular maintenance timetable—to avoid breakdowns on the job.

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FINAL DRIVE and transmission lubricants should be drained as winter approaches and replaced with recommended grades for cold weather operation. A clean-out with flushing oil is good practice.

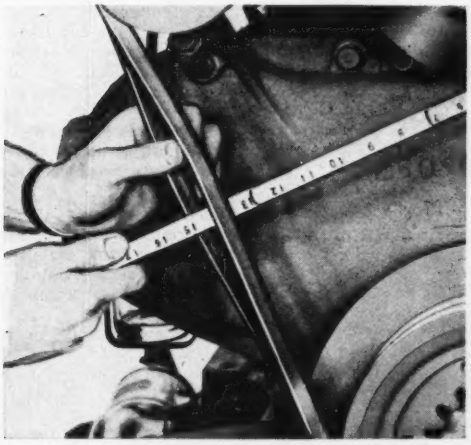
CRANKCASE BREATHER should get periodic check to keep it unclogged. Crankcase ventilation is important at all times, but winter operating conditions cause more condensation and acid fumes.

How to Winter Condition Crawler Tractors

By FRED J. SHRECK, Supervisor of Service, Industrial Power, International Harvester Co.

OLD MAN WINTER pulls no punches and plays no favorites. Winter down-time will cost you money unless you winter-condition your crawler tractors right now—and remember that cold weather repairs are difficult to make in the field.

The strain of low-temperature starting and the use of incorrect grades of oil often turn small defects into breakdowns. So don't even try just "getting by" this winter. Start your preventive maintenance program for crawlers at the first opportunity before the cold sets in.



FAN-BELT ADJUSTMENT is no less important for cold weather with anti-freeze in cooling system than during summer months. Measure belt tension, as recommended by tractor manufacturer.

• **Oil leaks**—The first thing to do is to check for oil leaks. Look for collections of new, oily dirt in odd places. And in the case of a dirty engine, look for places where leaking has streaked the dirt. Make the same careful visual inspection of the engine, transmission and final drive housings, the sprocket gear and track rollers.

The next step is to clean the tractor and engine—for four basic reasons: (1) Aids proper cooling of engine; (2) Oil leaks show up faster; (3) Decreases fire hazard; (4) Gives operator more pride in his tractor.

Proper engine cooling is especially important in cold-weather operation because the lighter winter oils run hotter than heavier oils. The oil film protecting moving parts gets thinner as oil temperature rises. Any dirt packed on the crankcase impedes proper cooling of light oils, reducing their lubricating effectiveness.

Cleaning can be done with high-pressure water or steam. However, a low-pressure stream of water is preferable. Wipe off the bad spots with diesel oil or kerosene. Using low-pressure water eliminates the possibility of damage to any gaskets or seal points.

• **Lubrication system**—In going over the lubrication system for winter, begin at the crankcase. Engine oil gets heavy with use because the light ends of the oil burn off in combustion leaving the heavier base oil.

Drain old oil from a thoroughly warmed-up engine, preferably after a day's run. Then flush the crankcase

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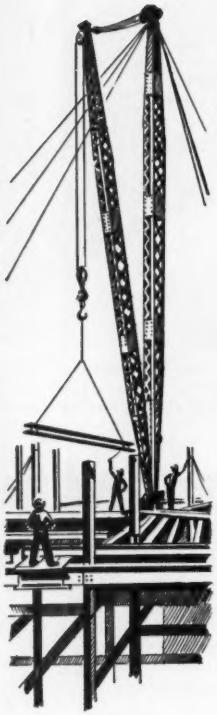

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with regular crankcase flushing oil — not diesel fuel or kerosene. (Sometimes when kerosene or diesel fuel is used, enough is trapped inside to cause foaming of the new oil when crankcase is refilled.)

Run the engine at half-throttle with the flushing oil for ½ hr. Drain oil filter, wipe inside with clean cloths and replace old filter elements with new.

Now refill the crankcase with grade of oil recommended by manufacturer for temperature at which tractor is to be operated. Change oil in fuel injection pump but do not flush.

Transmission, final drive and sprocket drive are next on the list. The lubricants in these units become heavier with use. In fact, if high-viscosity lubricants are left in too long, they will lose their good lubricating characteristics and tend to "channel" around the moving parts so that the parts run dry. As these units heat up in use, dirty oil on the outside of housing is sucked inside through any seal leaks or through the ventilator.

Metal-wear particles also become mixed into lubricants. Their presence can be verified by magnetizing a rat-tail file and sticking it inside the housing. It will come out covered with metal particles whenever this condition exists.

For these reasons drain the lubricant without fail, even though the units appear full. Then put in flushing oil, not kerosene or diesel fuel, and operate the tractor for 15 min without load. Drain and refill in accordance with manufacturer's recommendation.

Next, refill the lubricating gun with the proper lubricant and force old lubricant out of track rollers with new. Follow this with a complete chassis lubrication. Wipe off excess lubricant. It gathers dirt and is sometimes drawn back into lubricated point by heat. This causes rapid wear.

• **Electrical system** — Clean battery terminals with solution of warm water and baking soda, using a wire brush. Dab grease or special paste on terminals and tighten them.

Also check specific gravity of cells with hydrometer. Water level should be brought up with distilled water. Continual low water in battery is an indication of an overcharge condition which calls for corrective action by authorized repair personnel.

Look for worn generator brushes

(Continued on page 86)

Adams No. 610

King of all Heavy-Duty Motor Graders

"The real heavy-duty champ of motor graders"—"Does 30% more work" . . . That's what owners say about the Adams No. 610 after two years of toughest service.

A big, rugged machine (weighing up to 27,000 lbs.), the No. 610 is engineered to utilize the full torque of its 100-hp. diesel engine—*in all gears.* It's a machine that carries the punch and rugged staying power to tackle and whip biggest, roughest grading jobs.

What's more, the No. 610 offers a combination of operating advantages not to be found in any other motor grader, regardless of size:

Push-Button Starting from Cab—standard.

Power Steering of Mechanical-Hydraulic Type—standard. All advantages of mechanical steering, with power doing the work.

Large, Wide-Tread Tires—for maximum traction and flotation.

8 Overlapping Forward Speeds, 2 Reverse. High transport speed of 25 mph.

Extra Wide Blade (28 in.)—to utilize the great capacity of the No. 610.

Let your local Adams dealer give you complete information on the No. 610—the greatest of all heavy-duty motor graders.

J. D. ADAMS MANUFACTURING COMPANY • INDIANAPOLIS, INDIANA

Make your next motor grader an **Adams**

(Continued from page 84)

and check commutator and armature. Here again, repairs should be made only by experienced mechanics.

Voltage regulator, starter and generator should be fully checked, tested and adjusted. This can be done effectively only by a qualified mechanic using proper testing equipment. This equipment is portable however, and can be taken to the job site by most distributors.

In case of a bad connection or corrosion, the voltage regulator would not work properly, causing high voltage and low batteries. Indications of this are continual low water in battery and premature wear of commutator and brushes. Remember to check bearings and bushings of generator and starter.

• **Combustion system** — For fast starts and peak efficiency during winter, there's nothing more important than proper adjustment of the combustion system. Start by cleaning plugs and properly spacing the gap. Check all spark plug wires and connections. Adjust or replace magneto or distributor points, as needed. Clean magneto impulse coupling with kerosene and lubricate with a light oil. SAE #10 is satisfactory in most cases.

Don't overlook the air cleaner. It should be removed and disassembled. Wash out with diesel fuel or kerosene. Re-assemble and fill with recommended grade of oil, usually the same as that used in crankcase.

Be sure to check all air cleaner connections to the inlet manifold and make repairs where necessary.

Diesel fuel filters and water traps shouldn't be passed over. Take them apart and wipe out with clean cloths. Otherwise, the water and debris will cause a starved condition and reduce engine power as fuel gets heavier with cold.

• **Cooling system** — First of all, check for leaks in the head gasket. To do this, remove radiator cap and fill cooling system to the top. Start engine and run long enough to open thermostats. Accelerate suddenly; if bubbles appear, it is a good indication that cylinder head gaskets are leaking. Also check for leaks in hose, hose connections and water pump packing. Check radiator for leaks by a careful visual inspection.

Flush radiator with flushing compound or a solution of baking soda. Leave off radiator cap and run until hot. Drain and flush with clean water. Drain and refill with the anti-freeze called for by manufacturer. Also check the fan belt and fan belt drive pulley for looseness and adjust.

A good way to clean the outside of the radiator is to splash water from a 1-lb coffee can through the fins with the engine running at high idle. The fan will draw water through the radiator and suck out a lot of debris that can't be seen while lodged between the fins. *Caution:* There is danger of breaking the fan blades using this method if more water than a 1-lb coffee can holds is used at a time.

• **Engine ventilating system**—To insure proper combustion and lubrication, clean the complete engine ventilation system, including crankcase breather on side of engine, breather pipe and elbows on top of the valve cover. This step is important because these pipes take out condensation which often causes corrosion and failure of valve springs and rocker arms. This is one precaution that should be underlined. Furthermore, it is

RUNWAYS BECOME SPEEDWAYS

WHEN POURING CONCRETE WITH GAR-BRO Power-carts

...HANDLE MORE THAN 3 PUSH CARTS!
...TRAVEL 2 TO 3 TIMES AS FAST!

ONE MAN WITH a Power-cart can do as much work per day as 6 to 10 men with wheelbarrows. Up-hill, down-hill, over runways or rough ground, the Power-cart moves a 14 cu. ft. load at speeds up to 12 mi. per hour. Get the facts on its low price, low operating cost and low maintenance cost; write for Bulletin No. 83.

GAR-BRO MANUFACTURING COMPANY
2416 E. 16th STREET
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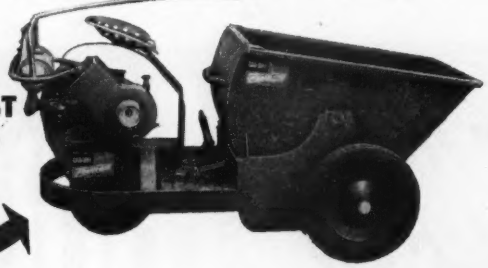
LOWEST PRICED IN ITS CLASS



recommended that engine ventilating systems be checked frequently during cold weather operation.

• **Cold weather starting tips**—For tractors working and parked for extended periods in cold weather, it's a good idea to equip them with hood sides.

Avoid parking tractor in exposed places for long periods without running. If necessary to keep a tractor outdoors in winter, run it at least once every day.

In temperatures of 10 deg or below, dilute oil in air cleaner and crankcase with kerosene in accordance with manufacturer's specifications.

Fill fuel tanks at end of work day to prevent collection of moisture.

• **Storing tractors over winter**—Store in dry and protected place; thoroughly wash and clean tractor; completely lubricate tractor. Drain diesel fuel tank, water trap and fuel filters; open air vents to obtain complete drainage. Then close vents. Work flushing oil through the fuel injection system as recommended by manufacturer.

Drain all water from cooling system; drain all gasoline from gas tank, strainer bowl and carburetor.

Attach an oil can to an air gun and, using a light oil with rust inhibitor, spray through spark plug holes, inside the valve cover and all surfaces above oil level. Then spray inside gas and fuel oil tanks.

With these simple precautions, whether you work or store your crawler this winter it will last longer and stay on the job without failing when the chips are down.

Safety Is for You

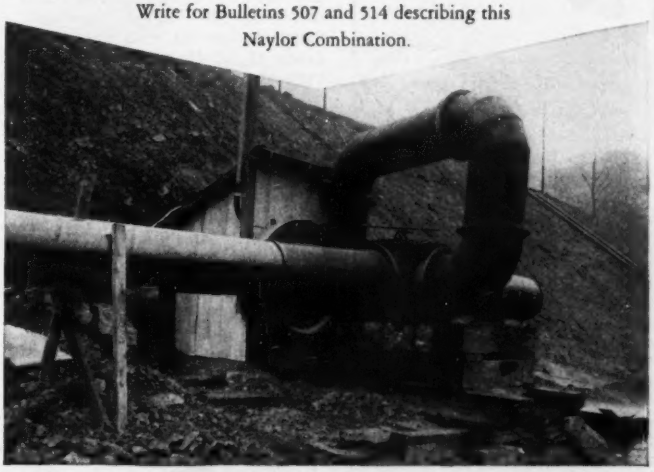
SPIKE SEZ: Holy mackerel! The Boss himself sits under that loaded shovel! How can he insist on Safety Rules?

HOW TO PROVIDE
FRESH AIR For Underground Construction

Contractors have found the practical answer in the combination of Naylor Pipe and Naylor Wedge-Lock Couplings.

Air lines can be installed quickly with this dependable lightweight pipe and these one-piece, positive-type couplings that provide the fastest possible connections, even in limited space. Though light in weight, Naylor Pipe has the extra collapse strength, due to its exclusive Lockseam Spiralweld structure, to do double duty in push-pull ventilating service. Thus, Naylor lines supply fresh air as well as exhaust dangerous fumes.

Write for Bulletins 507 and 514 describing this Naylor Combination.



NAYLOR PIPE

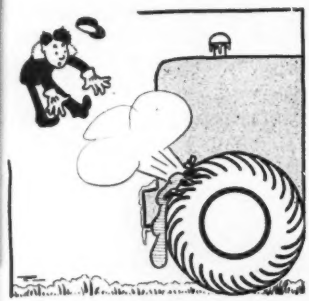
Naylor Pipe Company, 1268 E. 92nd St., Chicago 19, Ill.
New York Office, 350 Madison Avenue, New York 17, N.Y.

Winterize for More Profit, Less Down-Time

By HOMER C. CAMPBELL

Service Manager H. W. Moore Equipment Co., Denver, Colo.

IRRESPECTIVE of how much work a contractor carries on during the winter months, it is true that change of season automatically provides a convenient period for invoicing and inspecting vital construction equipment. Dirt is no respecter of geography. Whether north or south it is still dirt and can cause failures of bearings and



other working parts in equipment. Therefore, seasonal changes are in order, the only difference being in the manner of preparation for the weather to be encountered.

In the colder climates it is, of course, essential that cooling systems be cleaned and prepared for a season of cold weather operation—proper anti-freeze installed and carefully checked periodically to see that the proper proportions are maintained for the climatic conditions encountered. Every pound of scrap metal is needed urgently at this time, but cracked cylinder heads and engine blocks, caused by carelessness, are not needed and detract from the cause rather than add to it.

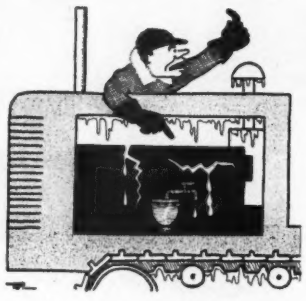
This is a time of year to stop and give the equipment units a going-over. They have served faithfully during the summer working season; give them a chance and they will serve well during the coming winter months.

The electrical system needs attention: generators, batteries, starting motors and wiring must be in top condition to get quick starts early on cold mornings. Pulling and pushing equipment to get engines started is a sure sign that maintenance is being neglected.

Summer lubricants are not satisfactory for winter operation in our colder climates. The winter changeover period is an ideal time to drain and flush all lubricant compartments and re-fill with the proper grade of oil. If you are not conversant with the proper weight or SAE number of lubricant to use, get an operator's manual for the equipment being serviced and follow the manufacturer's recommendation.

Hearsay advice can cause a lot of trouble during cold weather in the matter of lubrication. Wrong types of oils and greases may cause lost time in getting started and after getting started, may not do the job required.

Pneumatic tires, supposedly



filled with calcium chloride for extra weight, have been known to freeze and burst in cold weather. Better give a little thought to that item while rubber-tired equipment is down for winterizing. Tires of this type are in limited supply.

The hydraulic system must be considered right along with the other lubrication problem. Drain and flush the system, clean filter screens and refill with oil of correct viscosity for the climatic conditions involved.

Lubrication procedure for items that get daily service must be altered to fit the season also. Track roller lubricants must be changed for the season and other gun-type greases and oils provided for the cold haul ahead.

Then there is an item that is vitally important to the welfare of your business—the operator. He cannot produce profitably if he is not reasonably comfortable, and he is the guy that puts the dirt from here to there. He is the payoff; so give him a break. Many items for the comfort of the operator are available, such as cabs, tractor enclosures, and heaters.

And, bear this in mind, you just cannot call or walk into your supplier's shop and get all the parts you want. You must assist in making the available supply go as far as possible. Your help is needed and must be had. Winter has come and spring will be far behind. When spring arrives, you will be ready to shove off on a lot of good summer work—if you have followed through on a preventive maintenance program.

REVOLUTIONIZES CONSTRUCTION FASTENING!

Cartridge-powered tool fastens steel or wood to concrete or steel in seconds . . . no outside power source

Exhaustive tests prove the new cartridge-powered Remington Stud Driver to be the finest, speediest fastening system ever devised . . . easily sets as high as 5 studs per minute. No other equipment needed. Speeds work and cuts costs. The Model 450 Remington Stud Driver is made by Remington Arms Company, Inc., America's oldest and foremost sporting arms manufacturer. For detailed information and the name of your nearest distributor, fill out and mail the coupon below. There may be slight initial delays in delivery until production and distribution catch up with demand.

"If It's Remington—It's Right!"

Remington DUPONT

LOOK AT THESE EXCEPTIONAL FEATURES

COMPACT AND PORTABLE — Weighs only 5½ pounds, ideal for scaffold, ladder, overhead work, inaccessible places. Comfortable to use in any position.

SPEED—One man can set up to 5 studs per minute, as much as 100 times faster than other methods. Sets stud at whatever depth is required up to 2¾ inches, depending on material.

ELIMINATES INVESTMENT IN OUTSIDE POWER —Self-powered. Especially useful in isolated places.

TRIPLE SAFE—Plainly visible red dot indicator shows when it's cocked; safety must be depressed before and during squeezing of main trigger; permanently attached safety shield must be compressed against work before Stud Driver will operate. Trigger can't be accidentally tripped. Slight recoil. Low noise level.

WIDE VARIETY OF STUDS are available for every fastening job. Genuine Remington studs are trademarked for user's protection. Pull-out resistance as high as two tons in good concrete, depending on stud used. Cartridges are available in 5 power loads covering practically all fastening needs.

UNIQUE, FAST ASSEMBLY OF STUD AND CARTRIDGE—Tough plastic heel cap permits lightning assembly of any cartridge with any Remington stud, identifies power load, protects head and thread of driven stud.

PRICE for Model 450 Remington Stud Driver complete in rugged steel carrying case—only $119.50.

Speeds all these jobs . . . and many more

1. Hanging steel sash and door bucks to concrete and brick.
2. Anchoring wood plates to concrete floors and ceilings for setting partitions.
3. Fastening wood furring strips to concrete for attachment of metal lath.
4. Anchoring suspended ceilings, sprinkler systems and lighting fixtures to concrete.
5. Attaching conduit and panel boxes to steel and masonry.
6. Anchoring light machinery to concrete pads.
7. Erection of signs, awnings and venetian blinds on steel or masonry.
8. Hanging radiator housings to concrete or brick.

MAIL THIS COUPON TODAY FOR FURTHER INFORMATION

Remington Arms Company, Inc.
Industrial Tool Division
933 Barnum Ave., Bridgeport 2, Connecticut

I am interested in obtaining detailed information on the Model 450 Remington Stud Driver.

Name _____

Firm _____

Position _____

Address _____

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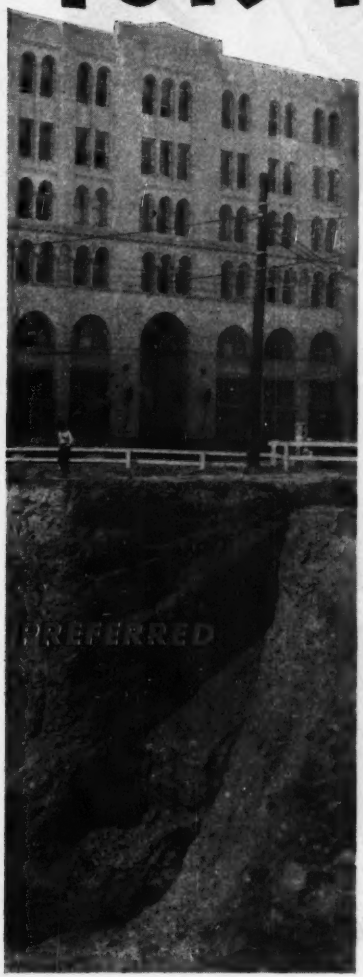
TODAY'S

ALWAYS THE INDUSTRY'S STANDARD

Excavating the foundation for a super highway overpass in Los Angeles is one station 2-yd. 51-B clamshell.

BEST BUY FOR TOMORROW



Since the early days of steam power and horse-drawn wagons, Bucyrus-Erie machines have worn the crown of excavator leadership. Today's Bucyrus-Erie assures you top-notch shift-after-shift performance on your present contract and during the years ahead. "Excavator trained" engineers combine the finest materials available with modern advanced design to produce a machine with outstanding durability and long life. Upkeep requirements are extremely low — adjustments easily made, long lasting. All machinery is readily accessible for maintenance.

Bucyrus-Erie's famous in-the-field convertibility lets you change front ends quickly and easily, so one excavator can handle a variety of chores on the same job by switching front end equipment in a matter of hours. Shovel, dragshovel, dragline, clamshell and crane attachments are constructed with the same precision and sturdiness as the main machinery — built to last the life of the machine.

Now is the time to be sure that the excavator you buy will keep your output high for many years to come. See your Bucyrus-Erie distributor for the whole story on this long-lasting line of ⅜ to 4-yard gasoline, diesel and single motor electric excavators.

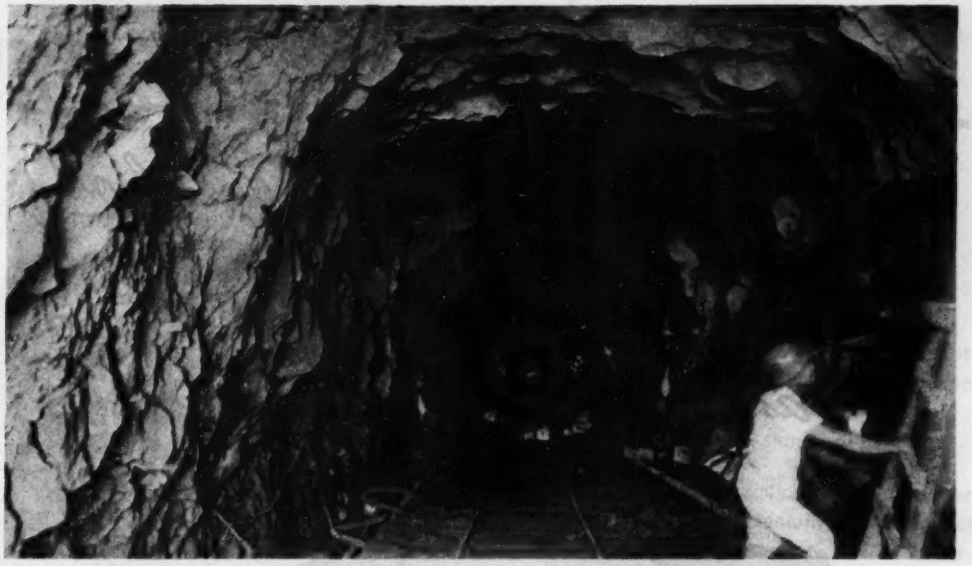
296E51C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

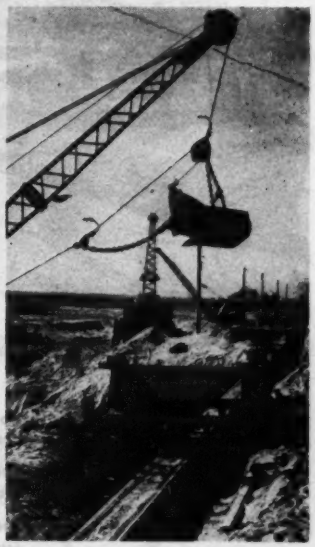
Bethlehem supplies every type of Fastener

CONSTRUCTION 'ROUND THE WORLD . . .



LOOK! NO PROPS — Entrance shaft to water tunnel in a hilly area in the central part of the island of Oahu, which will supply water for Pearl Harbor and Honolulu. Tunnel serves as well to catch water seeping between layers of lava covering the volcanic island. Instead of boring wells vertically, collecting tunnels are constructed by much the same method as small American coal mine diggings. Ordinarily, such water tunnels need no supporting construction to prevent cave-ins and diggings are relatively free of dust and gases. This tunnel measures 12x12 ft at beginning, but tapers to about half that size at its end in the rock, 1,696 ft away. U.S. Navy is constructing water facilities and will operate them, supplying both military and civilian needs to a maximum of 45 mgd.

FAITH — Primitive construction follows wake of war in Korea. One year ago, U.N. forces recaptured Chinju, found 60% of the city and its suburbs destroyed, some 60,000 homeless. Native builders have not waited for war to end but have erected crude, but substantial, timber columns and sturdy roof framework, are now weaving reeds to form watertight roof. City is being rebuilt rapidly and its people optimistically are looking forward to better times.—Eastern Publishers Service photo



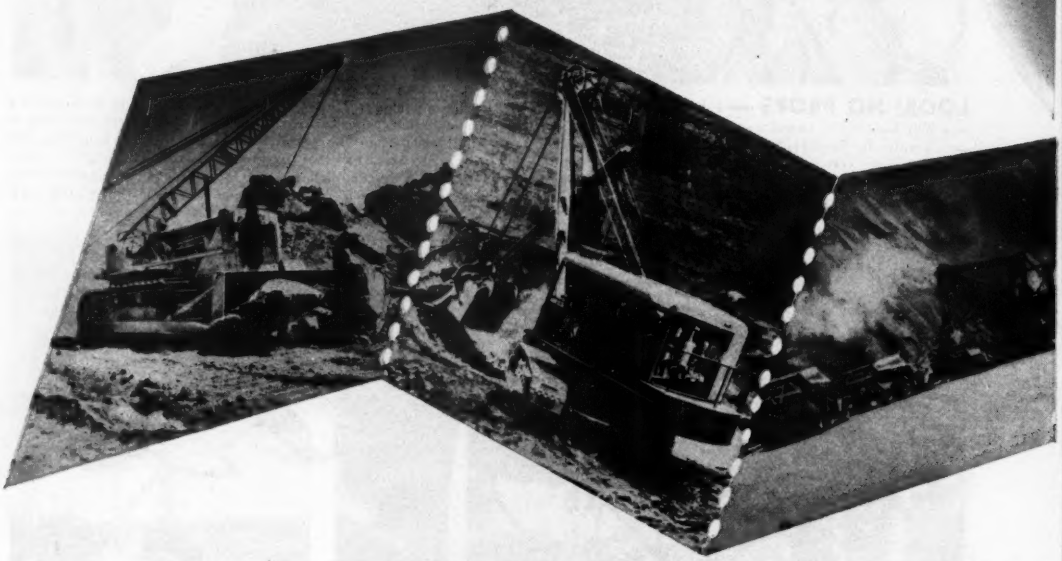
SOVIETS GO MODERN — Three draglines load hoppers which funnel construction material on to conveyor belt on one section of Russia's great project, the Volga-Don Canal. Bulldozers and scrapers supply the draglines. — Sovfoto

LONGER ENGINE LIFE

because this lubricating oil also

CLEANS ENGINES

—and keeps them clean!

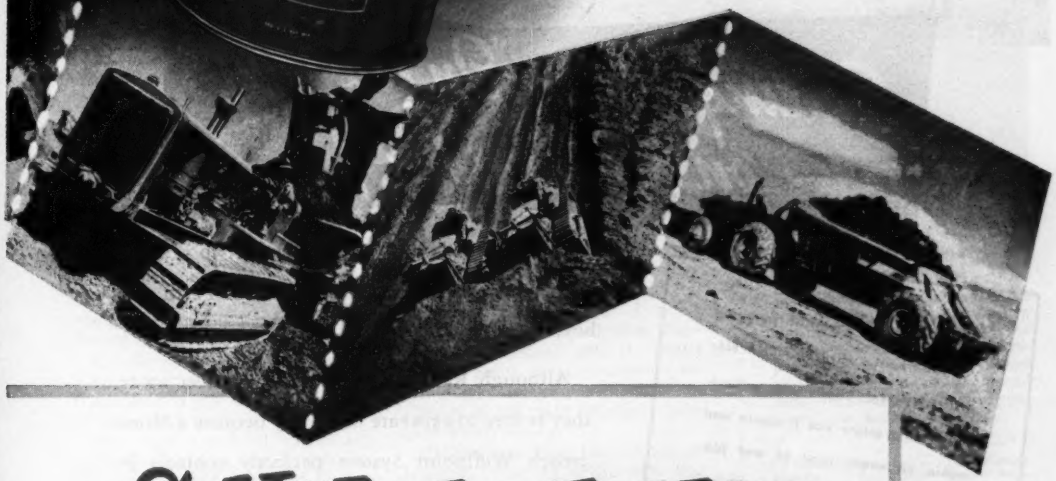


- No more lacquering of pistons, cylinders, valves.
- TENOL keeps valves and rings from sticking.
- TENOL prevents clogging of oil pump screens and oil channels.
- With TENOL, engines stay clean—free from harmful sludge and carbon.
- TENOL does not thin out at high temperatures, flows freely at low temperatures.
- Low oil consumption with full power, with TENOL.
- TENOL prevents corrosive wear of bearings and other parts.
- TENOL eliminates foaming.

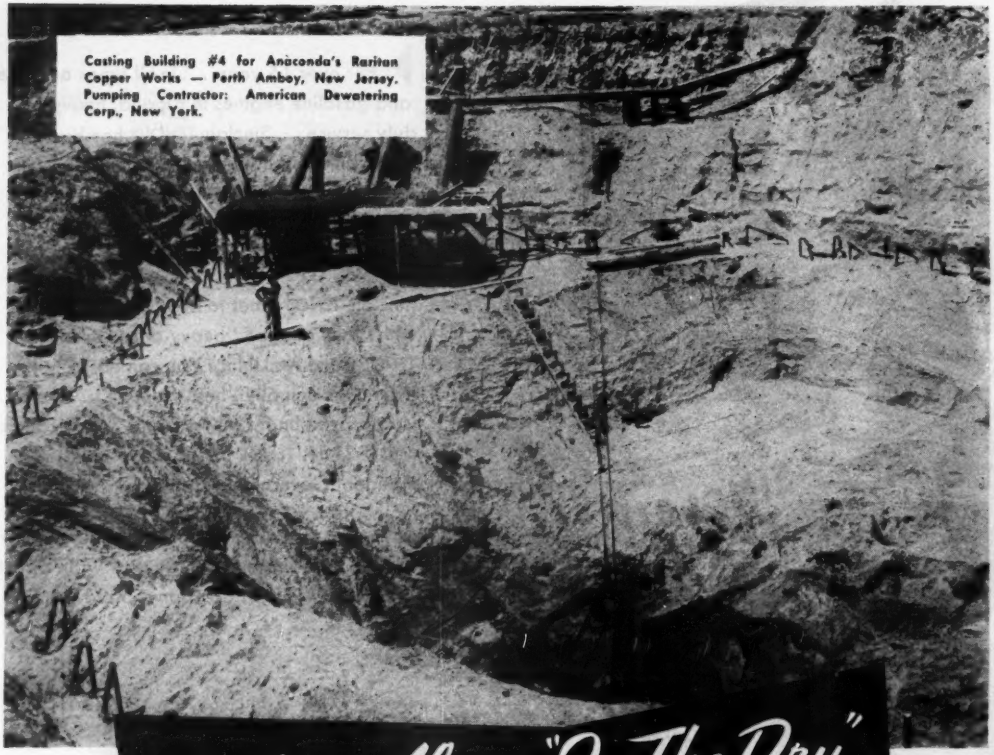
For over 15 years . . . in all types of diesel and gasoline engines in rugged, heavy-duty service . . . Sinclair TENOL® has been doing an outstanding job. TENOL has proven it provides long periods of trouble-free operation at sustained high power output, with lowered upkeep costs.

Sinclair TENOL is not to be compared with many alleged "heavy-duty" oils. TENOL is the real thing! You can easily tell if an oil is actually "heavy-duty" . . . See if it is approved under new Military Specification MIL-0-2104. TENOL far surpasses this stringent Government standard!

Save your valuable equipment — phone your nearest Sinclair Representative or write direct to Sinclair Refining Company, 600 Fifth Ave., New York 20, N. Y.



SINCLAIR TENOL
prolongs engine life



Casting Building #4 for Anaconda's Raritan Copper Works — Perth Amboy, New Jersey. Pumping Contractor: American Dewatering Corp., New York.

Sailing Along "In The Dry" on Raritan Bay

It's smooth sailing on this deep wet job for the contractors, Wallace J. Wilck, Inc., of Perth Amboy, N. J.

Although Raritan Bay is only 300 feet away, they're free to excavate in the dry because a Moretrench Wellpoint System perfectly controls 30 feet of water in sand and gravel, with silt and cemented sand at subgrade.

For efficient, economical pumping you can't beat a MORETRENCH WELLPOINT SYSTEM. That's why experienced contractors use it again and again on every type of wet job. Our catalog illustrates many of these. Send for your copy.

MORETRENCH CORPORATION

90 West St., New York 6 — 4900 S. Austin Ave., Chicago 38, Illinois — 7701 Interbay Blvd., Tampa 9, Florida — 315 W. 25th St., Houston 8, Texas — Rockaway, New Jersey

Canadian Representative: Geo. W. Crothers Limited, Toronto, Ontario

Legal Decisions Concerning Construction

The Fraudulent Buyer

IF A PROSPECTIVE BUYER of some "left-overs" approaches the contractor, tells a perfectly good story, hands him a glowing financial statement, the contractor discovers that these statements are false and fraudulent, and refuses to sell, no particular harm is done, as the contractor still has the goods to sell to some solvent buyer.

Suppose, however, that the contractor falls for these representations, sells the left overs and then learns that he has been defrauded.

What remedies, if any, are open to the contractor in cases like this?

On this point the American Courts have unanimously ruled that the contractor may

(1) Reclaim the goods from the fraudulent buyer.

It is safe to say that this rule would be followed by any State Court in America, and has been specifically decided by the Alabama, Connecticut, Georgia, Illinois, Indiana, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New York, North Carolina, Texas, Utah and Wisconsin Courts, as well as by the Supreme Court of the United States.

In a Rhode Island case, it might be pointed out, a buyer made fraudulent representations to a salesman. The salesman guaranteed payment to the contractor, for whom he was working, on which the contractor relied entirely on making the sale. The salesman paid for the goods, and the court ruled that the contractor could not then retake the goods on behalf of the salesman.

(2) Reclaim the goods even from a purchaser who bought from the fraudulent buyer with knowledge of the fraud.

This rule has been specifically laid down by the Alabama, Georgia, Illinois, Indiana, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Missouri, New Jersey, New York and Texas Courts.

(3) Under certain circumstances, the contractor may reclaim the goods from the creditors of the fraudulent buyer, a rule which has been approved by the Alabama, California, Colorado, Georgia, Delaware, Ohio, Kansas, Connecticut, Louisiana, Maine, Maryland, Massachusetts, Michigan, Missouri, New Hampshire, New Jersey, New York, Oklahoma, Pennsylvania, Texas, Vermont and Wisconsin Courts, as well as by the Supreme Court of the United States.

One case which reported these decisions is McCormack *vs* Joseph and it can be found in 77 A. L. A. 236.

A "Flyer" in Lumber

THE CONTRACTOR had just signed up a contract for the Consolidated school building and was discussing the matter with the president of the Mejax Lumber Company.

"I see that you have to give the usual guarantee, signed by at least one good and responsible party, providing that you will carry out your contract according to the terms thereof," the president suggested.

"That's the point, and the only question is, who will I get to sign that guarantee?" the contractor queried.

The president tapped the blotting pad with his pencil, and made no attempt to follow the convenient lead.

"I'll need at least $130,000 worth of lumber if I get the contract," the contractor remarked.

The president "bit."

"And we can sell you better lumber at a closer price than any other concern in the State of Texas," he declared.

"If your Company'll sign that guarantee for me, I'll buy every foot of the lumber from you," the contractor declared. "If I don't land the contract, the Brewer Construction Company gets it. That's a settled point, and you can imagine how much lumber you'll sell them with that big mill of their own up at Swan Siding."

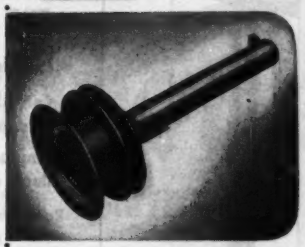
Half an hour later the contractor departed, bearing with him the guarantee of the Mejax Lumber Company, under its corporate seal, and signed by the president and general manager.

Three months later the contractor fell down on the job, and the creditors were howling around the front office of the president of the Mejax Lumber Company.

"You signed a guarantee and you've got to stand behind it," was

(Continued on next page)

2 ways to make crane operations pay more



Rud-O-Matic Magnet Reel Tagline Combination

Steel tagline holds magnet steady and absorbs the load . . . protective slack is maintained in expensive magnet cable to avoid jerking, pulling loose at the terminals or snagging.

Standard with major crane manufacturers, made in five sizes for your present equipment.

Rud-O-Matic Tagline

steadies your clamshell buckets. Provides ample coil spring power at all boom angles to keep bucket lined up with the work. Makes more loads per day easier. Rud-O-Matics are foolproof, trouble-free. Eight sizes meet all requirements. Available immediately. *For full information see your dealer—or mail coupon below.*

I'd like more information on ☐ Rud-O-Matic Taglines, ☐ Rud-O-Matic Magnet Reel-Tagline Combinations. Send literature and complete details.

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Company_____

Address_____

City_____ Zone____ State_____

McCAFFREY·RUDDOCK Tagline CORPORATION

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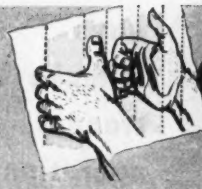


Only One Pair of Hands

NEEDED with ROOSHORS
THE ONE-MAN SHORE

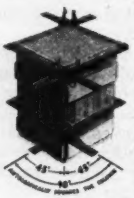
- Easy for one man to set and remove.
- Cuts shoring costs—no cutting, fitting or wedging.
- May be used over and over—floor to floor, or job to job.

Rooshors save in *time* and material . . . so naturally save money. They give instant adjustment in their range of three sizes: 8 ft. to 14 ft.; 7 ft. to 13 ft.; and 5 ft. to 9 ft.—higher stories are shored with Roos Extension Shores. Rooshors save every time you use them.

ROOS COLUMN CLAMPS

- Save Time
- Cut Column Forming Costs

Roos Column Clamps are so simple and foolproof to use (no "rights and lefts") that even inexperienced workers quickly develop efficiency. Roos Clamps automatically square the column forming.



Rooshors and Roos Column Clamps are available for rental from warehouse stocks in principal cities from coast to coast.

Write today for Bulletin 151

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INDIANAPOLIS 6, INDIANA

25 YEARS EXPERIENCE
for SATISFACTION
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the chorus of the creditors' song.

And the president consulted the company's attorney.

"Forget it," the attorney advised—evidently relying on the case of Bowman Lumber Company vs. Pierson, 221 South Western Reporter, 930, where the Supreme Court of Texas ruled that a company authorized to deal in lumber generally has no power to guarantee a contract of a third party merely for the purpose of enabling the lumber company to sell lumber to that third party.

"The pledging by a company of its credit for another's benefit as a means simply of enabling him to purchase its goods, is not a direct, and hence not a legitimate means of promoting its own business," said the Court in the Bowman case, and there are a few other courts which have arrived at the same conclusion.

It was lucky that the Mejax Company was in Texas, however, as the weight of authority is that such guarantees are generally binding, and there are Illinois, Michigan, Minnesota, New York, Oregon and Wisconsin cases upholding this rule.

Similar Decisions

An outstanding case where the guarantee was upheld is Woods Lumber Co. vs Moore. In a similar decision of the California Supreme Court reported in 191 Pacific Reporter, 905, the evidence showed that the Goldstein Company was selling "movie" costumes to the Continental Company, and in order to sell such costumes, the Goldstein Company guaranteed an account of the film in which the costumes were to be displayed.

In ruling that this guarantee was binding on the Goldstein Company, the Supreme Court of California says:

"In a business view the guaranty appeared to be essential to enable the Goldstein Company to obtain payments upon its contract with the Continental Company. It was to be reasonably expected that the making of the guarantee would advance the business of the Goldstein Company, and would secure to it the payment of the debt that would be due to it from its customer, the Continental Company. It was a thing helpful to the conduct of its business and tended directly to promote the same. All of these things are sufficient to bring the contract of guarantee within the scope of the implied powers of a corporation."

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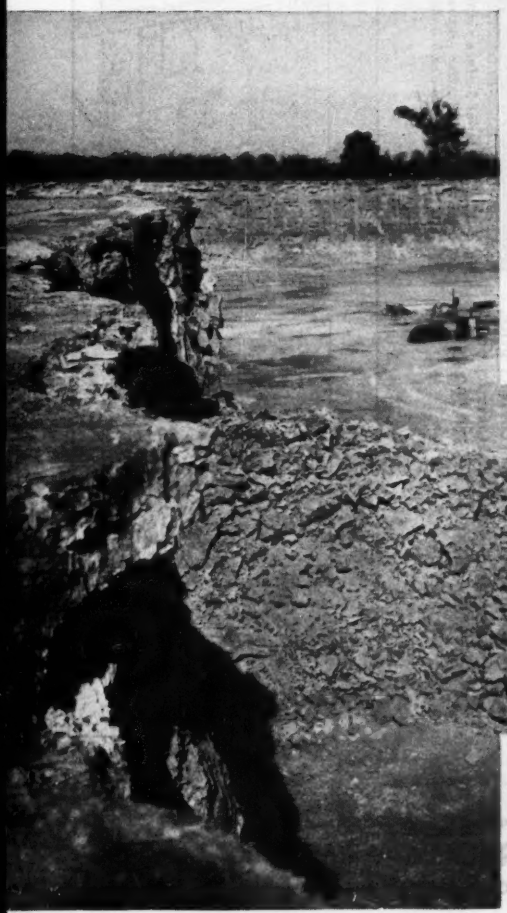

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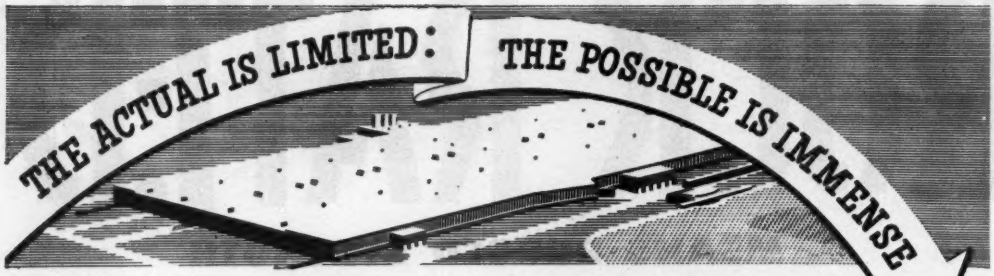

NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

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WELDED BRIDGE DESIGN CUTS WEIGHT 3000 POUNDS PER LINEAL FOOT

by **Homer M. Hadley**
Consulting Engineer, Seattle, Washington

SUBSTANTIAL savings in cost have been made possible through the use of light, welded-steel box girders in the Patton Bridge near Auburn, Washington. Substituting steel box girders for concrete on the central 100 ft. of the 200 ft. main span of this bridge has eliminated 3000 pounds per lineal foot with resulting reductions in stresses and necessary reinforcement in the concrete portions of the bridge.

The steel box girders incorporate the simplest of details. Made entirely of light steel plate, they can be easily fabricated in any welding shop and at a very reasonable cost. Total contract price, this 430 ft. bridge, $96,606.10. Contract price, steel box girders, @ 15¢ per lb., $10,590.75.

Fig. 3—200 Foot Span Highway Bridge *at Auburn, Washington. Concrete slab on two box girders eliminates need for cross bracing.*

Fig. 4—Clean Exterior Surface *simplifies painting to keep down maintenance costs. Box construction is ideal where minimum depth is desired.*

WELDED DESIGN ALWAYS SAVES STEEL AND LOWERS COST

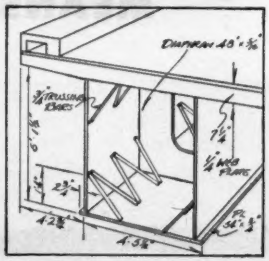

Fig. 1—Steel Box Girder Construction *half section at mid span for central 100 ft. of 200 ft. span highway bridge. H-20 loading. Web plates are ¼"; top flange is ⅜"; bottom flange is ⅜" to ½". Stiffeners are ⅛" plate.*

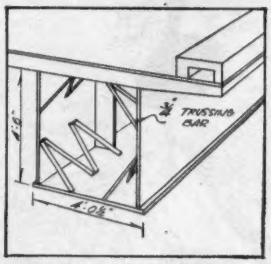

Fig. 2—Detail of Half Section *near end of span shows use of ¾" bars for trussing the four interior corners. Zig-zag in pattern, the bars contact both web and flange plates.*

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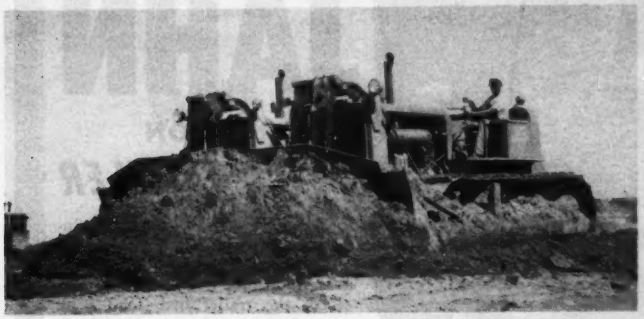
Siamese HD-38 Tractor Makes Its Debut at Garrison Dam



SPRINGING from the fertile minds of Ben Williams, project manager, and Lynn Abrogast, equipment superintendent for the combination of Peter Kiewit Sons Co. and Morrison-Knudsen, the Allis-Chalmers Siamese HD-38 makes it bow at Garrison Dam, N. D. (CM&E Oct. 1951, page 62).

The rig, named by its sponsors, is made up of two A-C HD-19 tractors with the inside tracks removed, both units are mounted on a common bed-frame with controls for the two engines tied into one control point on the left tractor.

The Siamese tractor was developed on the job primarily as a bulldozer with an 18-ft blade to knock down the extra high windrows left on the fill by 35-yd Euclid loads. Single-tractor bulldozers, powerful as they may be, have to ride the windrows and simply do not have the power it takes to level off the heavy stuff the wagons are now hauling from the lower outlet works channel.

This is the second Siamese tractor unit to be built. Last year we described a somewhat similar arrangement (CM&E April 1950, page 54) built by Peterson Tractor and Equipment Co. of San Leandro, Calif. They took the inside crawlers off two Caterpillar D8's, and bolted the sideframes together into a twin unit.

At Garrison they did it differently by mounting both tractors on a common bed-frame. The HD-38 has no steering clutches. Turning is done through the torque converter drive on each track, and the rig literally spins on a dime. At first the bulldozer blade was lifted by power-control units from each tractor, but it was found difficult to synchronize their movements. Now the blade is handled by a single power-control unit working through a multiple line.

The sponsors were rather ambitious at first, and built a 20-ft bulldozer blade for the rig. This was found too unwieldy to handle, so it was cut down to 18 ft. With both tracks out on solid, rolled fill, the HD-38 walks right down the windrows without a bit of trouble. It's quite a rig.

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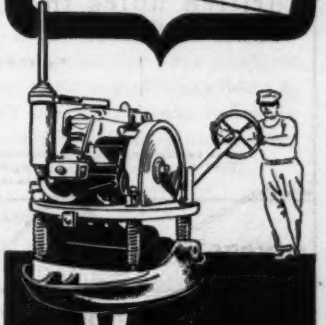

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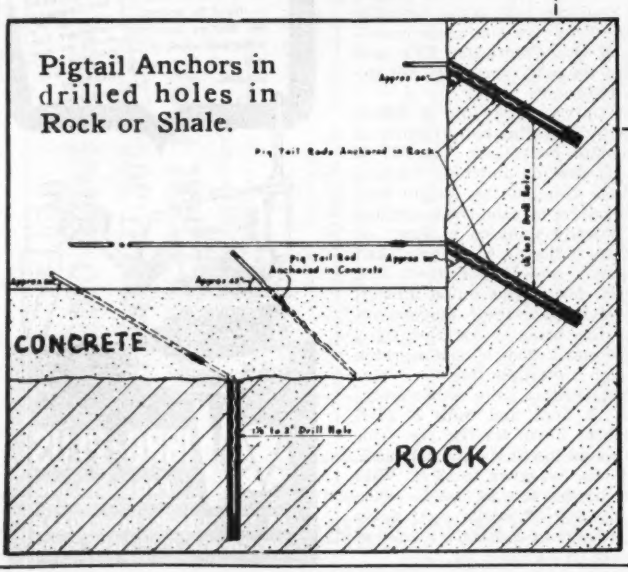

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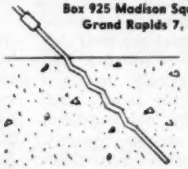

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Will Defense Production Be Caught in the Squeeze?

When Congress revised and extended the Defense Production Act, it relaxed a squeeze on business profits.

President Truman asserted that this action by Congress cripples the government in its effort to prevent inflation which, as he puts it, could lead to "enrichment and profiteering for the few, economic hardship and misery for the many."

He asked Congress to rescind its action.

This editorial—the second on problems presented by "escalator"clauses—aims to throw some light on this conflict of opinion.

The Squeeze

The squeeze on profits was imposed in the name of price stabilization. The idea behind it was simple. The *selling prices* of industrial products were to be held under a tight lid. But many industrial costs are affected by "escalator" clauses of one kind or another which tend to boost production *costs*. Thus, with rising costs and fixed prices, profits would be squeezed and much of the cost of defense would thereby be shifted from those favored by escalator clauses to business concerns.

The mechanics of this squeeze on profits were complicated. But here, in brief, is how it was to work. The first step was to require manufacturers to set ceiling prices, effective May 28, for their products.

These ceiling or maximum prices were to allow for increases in manufacturers' costs that had occurred since Korea. *But they did not allow for all increases.* Manufacturers, for example, could not include increases in indirect costs—office or selling costs. Neither could they, in calculating their new prices, include increases in the costs of materials or direct labor that had come after March 15. This was the first phase of the squeeze on profits.

The second phase was prepared by **not** putting a ceiling on costs. The Wage Stabilization Board said it could not disturb the operation of "escalator" clauses by which wage rates are geared to the cost of living. Moreover, nothing could be done to curb the operation of the farmers' "escalator" clause, the farm parity arrangement. Under it, the federal government underwrites higher prices for farm products to match increases in the cost of things farmers buy. So this left wages and many materials costs free to rise against a ceiling imposed on the prices of what industry has to sell.

Relief—at a Loss

On two conditions only would the Office of Price Stabilization permit a company to raise its prices and escape this squeeze. One of these was that increased costs had more than wiped out its profits; in other words, that it was operating at a loss. The other condition was

that the industry of which the company is a part was not, as a whole, making "excess profits." That is, the industry, as a whole, could not get price relief if its overall profits before taxes were greater than 85 percent of its average profits during the best three of the four years from 1946 through 1949. Many companies expected that their profits would be cut drastically before they could get through this narrow escape hatch.

When this squeeze on profits was set up, we were told that industry as a whole was reporting record profits. But, it was equally true that wage rates and farm prices also were at record high levels. And it was also true that, under the impact of rising taxes and the dislocations caused by the defense mobilization program, profits actually were on the way down.

Profits — Going Down

By the time Congress acted to relax the squeeze, corporate profits, after taxes, were running at a rate 20 percent lower than they had been six months before. And the clear prospect was that they would continue to decline.

So the issue put up to Congress was simply this. Should business firms stand so much of the brunt of the defense costs while "escalator" clauses continued to exempt organized workers and farmers from paying their share of those costs?

But this question actually is much broader than one of fairness or unfairness alone. One certain effect of such a squeeze on profits would be to undercut the capacity of private industry to install the new plants and equipment needed for our mobilization effort. Today — unlike World War II — private industry is financing almost all of our huge program to expand production. And about two-thirds of the money that has been plowed into the expansion and improvement of our industrial machine since World War II has come out of profits.

In view of all this, Congress decided last summer to relax the pressure on profits. This was done by the controversial Capehart Amendment to the Defense Production Act. This amendment has serious administrative weaknesses. But some measure with the same purpose is needed to maintain profits at a high enough level to finance the huge and continuing expansion of our industrial machine that is now underway.

Basic Issues

As soon as the amendment was enacted, the President asked Congress to revise the law again. The heart of his proposal was to restore to the Administration the powers it used last spring to arrange the squeeze on profits outlined here.

This controversy will continue. There can be no final answer to it as long as we have the economic controls made necessary by mobilization.

But if we look beneath the surface of this technically complicated controversy, we shall see clearly that the basic issues are:

1. Whether we really shall make an effort to distribute fairly the burdens of inflation caused by our defense mobilization —

2. Whether farmers and organized workers should be exempted from these sacrifices by escalator clauses — at the expense of the nation as a whole —

3. Whether profits should be squeezed still more — at the risk of putting a fatal squeeze on the effort of industry to build new plants and install new tools. These new facilities are essential to maintaining American living standards — and they are the heart of our ability to defend ourselves and the rest of the free world.

Americans face no more important economic issues at this time.

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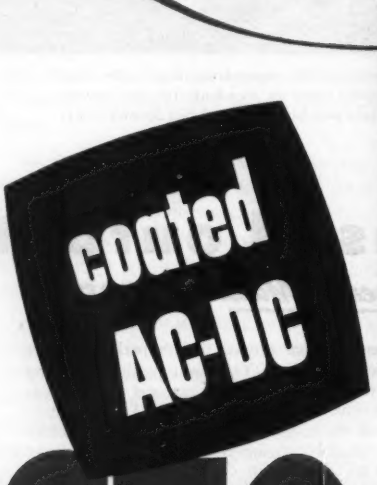

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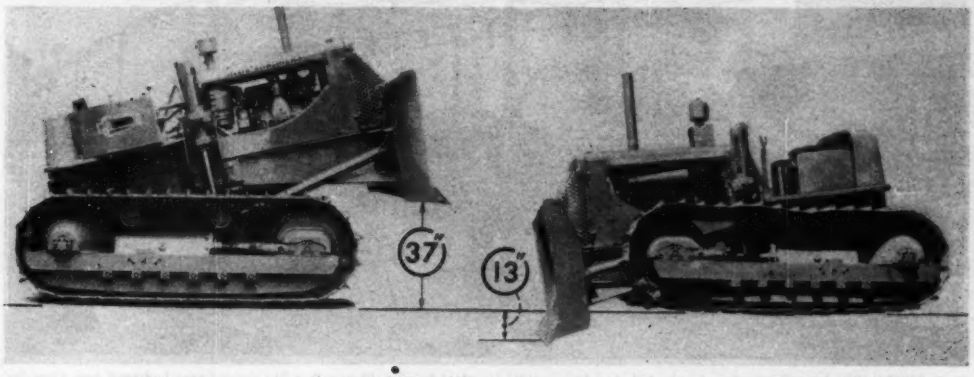
CONSTRUCTION EQUIPMENT NEWS

A Preview of New Machinery, Tools and Equipment That Will Help You on the Job

JAMES M. CONNOLLY, Equipment Editor



New Baker No-Pushbeam Bulldozer

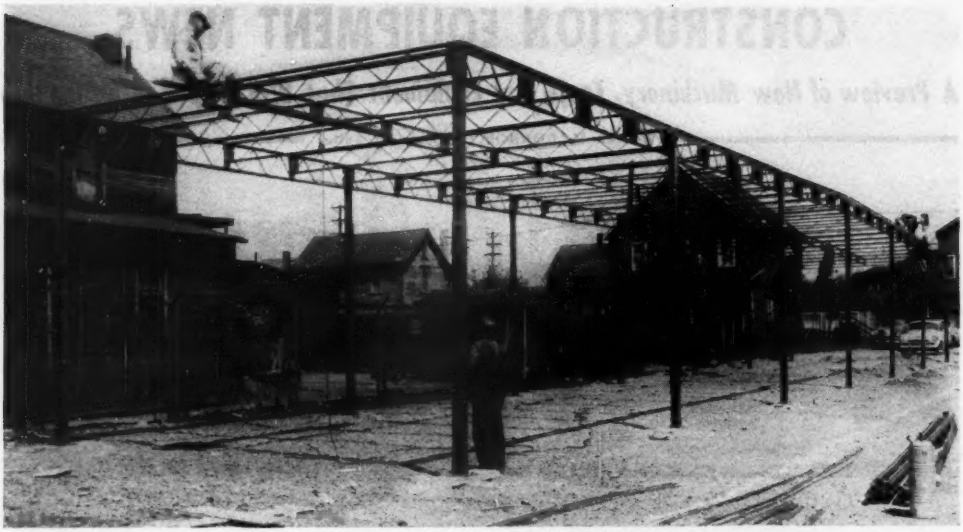
ALLIS-CHALMERS HD-9, with Baker No-Pushbeam Bulldozer in raised position, uproots a tree easily by lifting the blade its full 37 in.

THE FIRST really radical change in industrial bulldozer design for several years is the Baker "No-Pushbeam" model shown above. It's an addition to the Baker line of bulldozers, gradebuilders and root rippers regularly used with Allis-Chalmers crawler tractors. Designated as the 9-X, the 'dozer frame and tractor frame are bolted together as an integral unit, so the main tractor frame actually becomes the pushbeam. The tractor-'dozer is raised and lowered as a unit by double-acting hydraulic cylinders which support at all times the entire front end of the tractor frame, as well as the 9-X blade.

The new 'dozer has an 8-ft wide blade and is used on the 70-drawbar hp 9-ton Allis-Chalmers HD-9. The 5½-in. dia cylinders (the same size used on standard Baker bulldozers designed for the 6-ton heavier HD-15) exert approximately 24,000-lb pressure which is sufficient for constant support, as well as immediate blade response in either direction, according to the manufacturer.

In mounting the 9-X, the front spring and saddle are removed and the spring pads replaced by special brackets to which the lifting mechanism attaches. This mechanism is so designed that only vertical forces enter the truck frame at the identical points where forces would come in standard mountings. The blade has a maximum rise of 37 in., as shown above, and a drop of 13 in. below ground, allowing a steeper angle of approach due to the closer mounting of the blade to the tractor frame. The center of gravity on a 9-X mounted rig is said to remain well back of the second roller regardless of blade position, assuring maximum traction and permitting drawbar work without time-consuming dismounting of the blade. Although 18-in. tracks are recommended, 20-inchers can be accommodated.

The new unit weighs only 3,400 lb, a saving of 1,150 lb. Though reduced in width to 8 ft for easier over-the-road haul without special clearance permits, the height has been increased 6 in. so that it comes within 1 sq ft of retaining the area on the standard Baker blade for the HD-9. In exhaustive field tests it is reported to have dug a slush pit 6 ft deep, 8 ft wide, 50 ft long at the bottom in 81 passes in a total elapsed time of 80 min.—**The Baker Manufacturing Co., Dept. M, Springfield, Ill.**

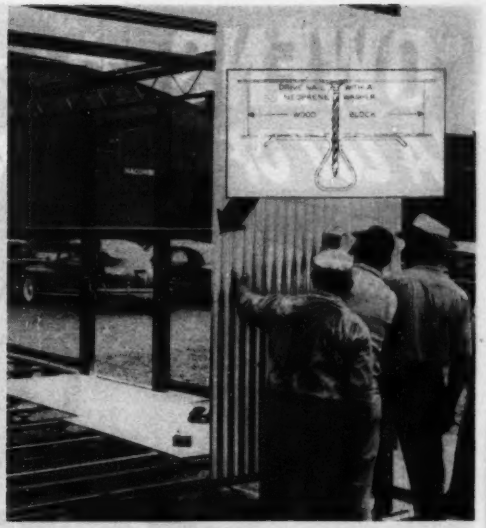


THE FOUR MEN shown here—armed only with two hammers and two wrenches—erected this 20-ft bay of the building, 120 ft wide, in just 2 hr. Interlocking members of Macomber Co.'s new V-Lok steel framing fit together like an ordinary bedstead and allow for future expansion, dismantling and relocation at any time. Drainage slope in both directions from the midpoint is clearly visible.

New Interlocking Steel Framing

FIRST STEP in erection job is adjustment of telescopic columns to correct heights for proper roof drainage. Next they are set up on end and their base plates fastened to four imbedded anchor bolts. Climbing rods are inserted through holes in the columns to form temporary ladders. Finally a sheave post is set at column top and a block and tackle attached. Girders, 20 ft long, are quickly raised and fastened to columns in bedstead fashion. Note purlin connections on 5-ft centers along both sides of the girder, allowing continuation of the roof later in either direction. Double purlin (right) is erected at the ridge line, end-fastened to ridge purlin connectors. Next a tie-plate is inserted, as shown, at the bridging line for continuous bracing effect.

WITH REMAINING PURLINS in place, bridging members are passed up to workman on plank, who quickly inserts them in same manner. Where needed, flooring joists are connected (right) and nailable steel girts fastened at top, center and bottom. Sag rods hung from center of top girt support center girt and bottom one also if flooring is omitted. Sway bracing rods are optional at ends.



Drive nails extend through wooden blocks curved to fit corrugations, then enter the nailing groove, as shown in the inset. These V-sections can be fastened to purlins, girders, bracing members and girts to fasten almost any roofing or siding material. Buildings can be erected, increased or decreased in any direction in increments of 20 ft, according to the manufacturer.—Macomber, Inc., Canton, O.

UNIT PROVIDES HIGH-PRESSURE STEAM OR HOT AND COLD WATER

Claimed to be the highest volume steam cleaning unit made in the United States, this "Power Master Unit" has two high pressure steam guns which deliver 150 gal per hr. In addition to this unusually large steam cleaning capacity, it incorporates a high-pressure water gun, shown at the right above, which will supply hot or cold water at a pressure of 500 psi, according to the manufacturer. The power blast feature of this unit delivers 1,000 gph of water for blasting away accumulations of mud, muck, greases, etc. The water gun has also been found efficient in de-icing operations, snow removal and the like.—**Kelite Products, Inc., 1250 North Main St., Los Angeles 12, Calif.**

IMPROVED ONE-MAN CHAIN SAW

Silver in color and more streamlined, the new Disston DO-101 one-man chain saw features a sturdier crankshaft, rapid-action stop switch, new fan housing and an F (for fast cutting) chain. The chain employs a comparatively small tooth with a lower cutting edge, short pitch and rounded guiding lug which is said to

(Continued on page 110)

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OWEN ROCK GRAPPLES of improved, latest design are available in various types with full blade, semi-blade, or rock tine independently acting tines.
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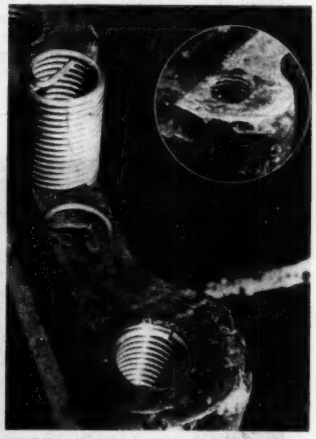
(Continued from page 109)

regulate accurately the depth of cut. During tests in Maine it bit through 18-in. saw-logs of dried, hardened red oak in 20 sec; through Carolina pine and poplar of equal size in 15 sec. The "F" will ride around a number of new guide rail lengths with over-all measure of 20, 26, 32, 36 and 40 in., the widest variety yet available.—**Henry Disston and Sons, Inc., Philadelphia, Pa.**

HIGH PRECISION TRANSIT — A precision transit has been announced for use in coast surveying, triangulation, highway and tunnel construction. Designated as model No. 30, it incorporates standard features of Breithaupt surveying instruments such as totally enclosed and dustproof construction, compactness and reduced weight. The instrument weighs 11½ lb and is said to have accuracy on vertical and horizontal circles of 1 sec. Telescope aperture is 40 mm and magnification 30 X. The sensitivity of the instrument's three levels is said to be 20 sec per 2 mm.—**Columbia Technical Corp., 5 E. 57th St., New York 22, N. Y.**

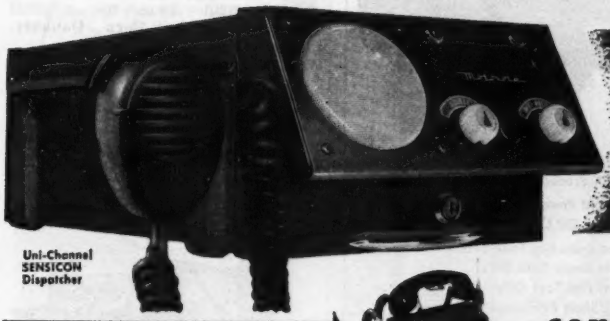


HELICAL INSERTS FOR THREAD REPAIRS—A brand new method of repairing damaged tapped threads in heavy machinery should prove mighty useful in construction equipment maintenance. The Heli-Coil Corp. has developed a stainless steel helical wire thread insert, installed by hand or power tools, that renews stripped threads in engine blocks and machinery working parts and frames. Caterpillar Tractor Co., for example, has already advised their distributors on possibilities of salvage of tractor engine cylinder heads by this method.

Any contractor or distributor can use Heli-Coils, for they don't require any elaborate tools to install. Simply: (1) drill out the old threads; (2) re-tap with Heli-Coil taps; (3) install the stainless steel thread in-

(Continued on page 112)

Simplified

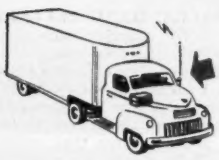


2-WAY RADIO

construction and maintenance tool

Set it on your desk, plug it into a socket, connect antenna, and you're in business with instant communication to all your mobile units.

... and a similar Uni-Channel dispatcher can be mounted in any mobile unit—matched pairs of "Handie-Talkies"* thrown into the action for the "foot soldiers" of Industry and Civil Defense.

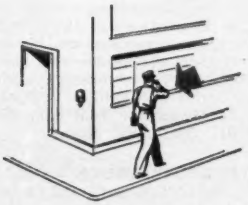


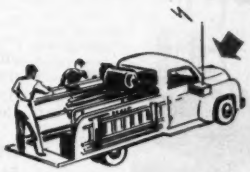
KEEPS ALL YOUR MEN IN CONSTANT CONTACT

... *Simplified Motorola Systems* offer you top performance of the marvelous Sensicon Circuit with Permakay for permanent selectivity and 7 other exclusive features that keep Motorola out in front as a better buy and sounder investment!

You need 2-way Radio for better communication. You need Motorola for more *Reliability*!

*Trade Mark of Motorola





Motorola

Over 20 Years SPECIALISTS IN MOBILE RADIO

MOTOROLA INC: COMMUNICATIONS AND ELECTRONICS DIVISION
4545 AUGUSTA BOULEVARD, CHICAGO 51, ILLINOIS
ROGERS MAJESTIC ELECTRONICS, LTD., TORONTO, CANADA

(Continued from page 110)

sert. The unmounted thread insert, with free diameter slightly larger than its receiving hole, is self-locking and has its notched inserting tang removed after placement with a tang break-off tool. The diamond-shaped 18-8 steel wire coils provide higher thread-flank engagements and consequently can withstand higher loads than the original threads.—**Heli-Coil Corp., Danbury, Conn.**

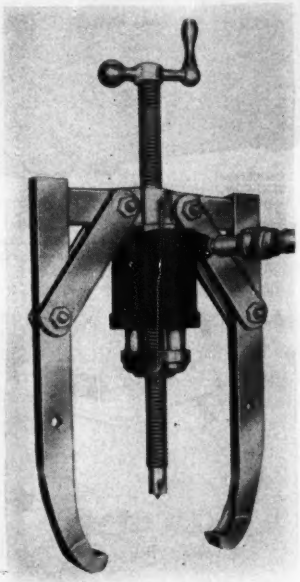
FUNK
Heavy-Duty
CLUTCHES, and POWER UNIT DRIVES

Here is the low-cost solution for keeping old equipment on the job. Repower, using FUNK Take-Offs and Clutches. Available in a wide variety of types to fit most requirements for shaft speed and installation space. Designed to fit any standard SAE flywheel housing or Ford Industrial Engine. Write for specifications, or assistance on your power problem.

FUNK Products include:

Straight Power Take-Off Clutches
Gear Reduction Take-Offs
Right Angle Take-Offs
Front End Take-Offs
Jack Shaft Extensions
Ford Tractor Conversion Kit, changes to 6 or V-8 engine, doubles power.

FUNK AIRCRAFT CO.
3303 Airport Drive, Coffeyville, Kansas



HYDRAULIC HAND PULLERS — Three of the popular sizes of OTC Grip-O-Matic pullers can be used with the new Power-Twin hydraulic puller. Only slight adjustments are necessary to make the changeover, which makes the pullers more efficient and increases their range of utility. Pulling jobs are made safer through a remote control feature. As shown in the photo above, the Power-Twin ram can easily and quickly be detached from the puller and used effectively on the company's push-pullers or on a bench or pedestal press. — **Owatonna Tool Co., 380 Cedar St., Owatonna, Minn.**

DUAL-PURPOSE TRUCK — Combination fork-lift-stacker and hand truck with elevating plaform is operated from a 6-v automotive battery. It will handle loads up to 750 lb. Hydraulic lift is operated by a battery-activated motor mechanism. Built-in battery charger can be plugged into any standard outlet. Platform is 21x18 in.—**Clark-Hopkins Equipment Corp., 1125 Spring Garden St., Philadelphia 23, Pa.**

PICK YOUR POWER with

The NEW Acker Teredo Drill...

No temperamental prima-donna is Acker's new, versatile Teredo Core Drill—*it performs efficiently with any power plant.*

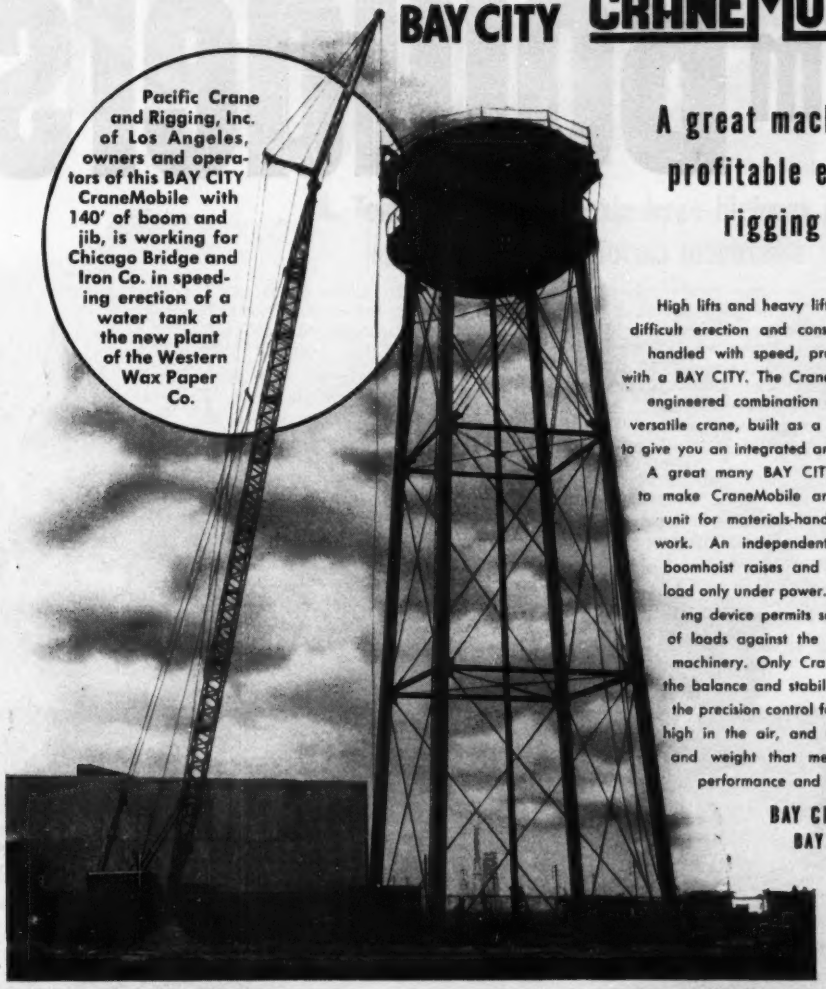
And for dependable, low-cost, trouble free operation anywhere in the world—Acker design and construction can't be beat.

See for yourself—write for Bulletin 33. CM&E.

Over 30 years' experience in the design and development of Drilling Equipment.

ACKER DRILL CO., INC.
SCRANTON 3, PA.

BAY CITY CRANEMOBILE



Pacific Crane and Rigging, Inc. of Los Angeles, owners and operators of this BAY CITY CraneMobile with 140' of boom and jib, is working for Chicago Bridge and Iron Co. in speeding erection of a water tank at the new plant of the Western Wax Paper Co.

A great machine for profitable erection and rigging work

High lifts and heavy lifts on all sorts of difficult erection and construction jobs are handled with speed, precision and power with a BAY CITY. The CraneMobile is a finely engineered combination of rugged truck and versatile crane, built as a unit by BAY CITY to give you an integrated and balanced crane. A great many BAY CITY features combine to make CraneMobile an efficient powerful unit for materials-handling and erection work. An independently operated power boomhoist raises and lowers boom and load only under power. A power load lowering device permits safe, accurate lowering of loads against the engine and crane machinery. Only CraneMobile gives you the balance and stability for heavy lifts, the precision control for delicate operations high in the air, and the extra strength and weight that mean dependable performance and extremely long life.

BAY CITY SHOVELS, INC.
BAY CITY, MICHIGAN

194

CHECK LIST

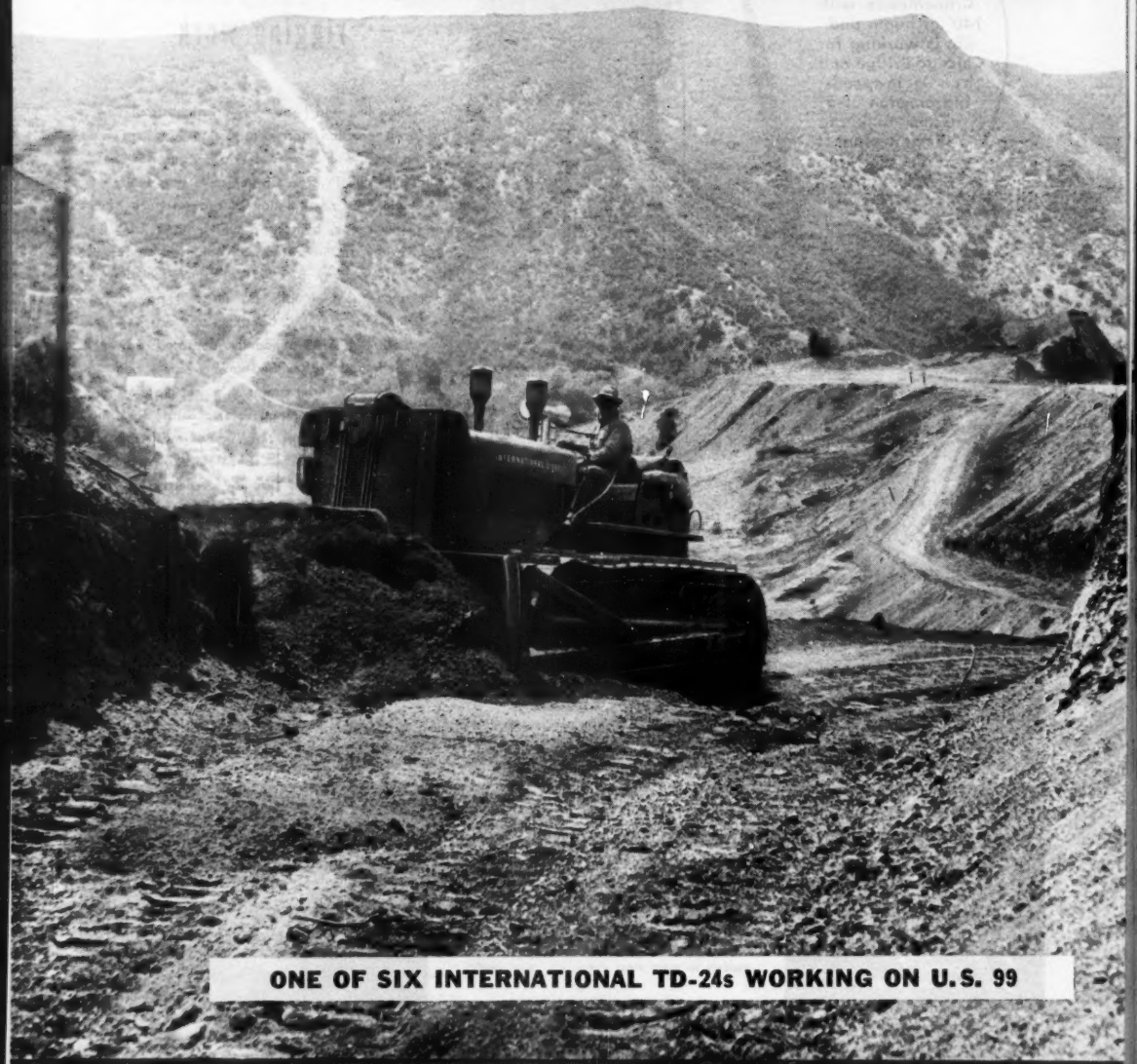
- 20-25 Ton Capacity
- Pin-Connected Boom
- Hi-Collapsible Gantry
- Independent Power Boom Hoist
- Precision Power Load Lowering
- Removable Counterweight
- Specially Designed Carrier
- High Road Speeds

Husky carrier, specially designed and built by BAY CITY, takes CraneMobile right to the job at speeds up to 35 miles an hour. Frame is heavily cross-braced to withstand the stress and strain of heavy swinging loads and long booms. Available in 6 x 4 and 6 x 6 drive with tandem axles. Complete with all accessories including many BAY CITY extras that are standard equipment. Five models to meet most every job requirement.

BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

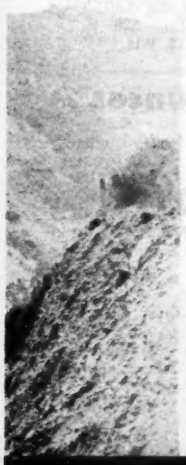
From Boulders



ONE OF SIX INTERNATIONAL TD-24s WORKING ON U.S. 99

to Boulevard

A. Teichert & Sons tackle huge highway job on U. S. 99 in California mountains



Fifty miles north of Los Angeles, A. Teichert & Sons are changing the face of California to modernize the main road to San Francisco.

They're digging into the rough, rocky hills with six Big Red TD-24s . . . charging in with International power to move over a million yards of boulder-filled earth—doze out cuts down to 350 feet deep—reroute a creek channel to eliminate present bridges—turn today's three-lane U. S. Highway 99 into a four-lane traffic-separated superhighway.

Teichert chooses TD-24s for the job because they're the Champs for this grueling, heavy-duty work. Here's why:

TD-24 Power—148 maximum horsepower at the drawbar, more than any other crawler on the market. Moves more dirt per hour.

TD-24 Speed—8 forward speeds, 8 reverse. Moves loads faster, gets out and gets in again faster for a faster work cycle.

TD-24 Operation—Synchromesh transmission, you shift "on-the-go." And you go up or down one speed without declutching.

TD-24 Steering—Fingertip steering for pivot turns, feathered turns, turns with power on both tracks.

TD-24 Starting—Push-button starting in any weather.

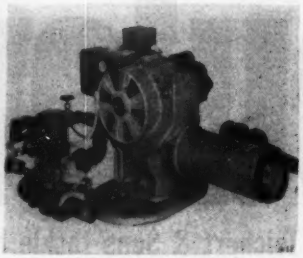
Ask your International Industrial Distributor for details on the TD-24. Consider his on-the-job service and complete shop facilities, at your call through the years ahead. Get the whole low-down! You'll be a TD-24 man from then on in!

International Harvester Company, Chicago 1, Ill.

INTERNATIONAL INTERNATIONAL HARVESTER **POWER THAT PAYS**

1,200,000 YARDS TO MOVE—and one of A. Teichert's International TD-24s gets at it. Among crawler tractors, the Big Red TD-24 is the Champ, with more power and speed to move more paydirt per day.

Scattered Jobs?
Get Action Fast...
See Pages, 16, 17



COMBINATION BURNER—Here is a burner which will burn gas in low-cost areas and may quickly be changed over to burn oil, when necessary. Advantages of the new line of burners include a forced air-draft system which provides a single blower fan for all air for combustion, assuring perfect control to the fire under any atmospheric conditions. They can be regulated to burn the proper amount of gas or oil for the requirements of any particular installation, says the maker. Modern electronic controls are used to guarantee that the main gas valve cannot be opened unless a pilot flame is established. Models range from 720,000 maximum Btu gas burned in the AMG-2 sizes to 8,700,000 maximum Btu gas burned in the AMG-7 size. — **Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis.**

Got a wet job?

Our WELLPOINT SYSTEMS have dried thousands of them quicker,- at lower cost! ...Our engineers will be glad to estimate your wet job!

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Please send Engineer to estimate our dewatering requirements.

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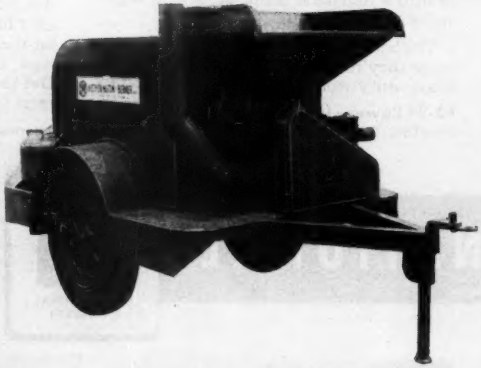
*Phone nearest office: NEW YORK, MElrose 5-7704; HAMMOND, IND., SHeffield 1082; JACKSONVILLE, FLA., JAcksonville 5-9323

Hetherington & Berner Announces

The Moto-Patcher



—a mobile mixing unit designed for easier, more economical road and street maintenance.

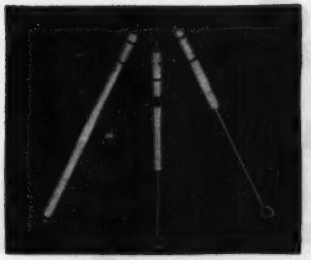
for speedy, low-cost patching

● The Moto-Patcher delivers up to 10 tons per hour of *freshly* mixed material. The aggregate may either be shoveled into the hopper, or fed into the hopper by a small elevator (optional equipment). The mixed material is deposited on a pan of convenient height for easy shoveling, or it can be dropped directly onto the road surface. The 400 gal. tank assures an adequate supply of bitumen for uninterrupted production, making frequent stops unnecessary. The mixer, running through the bitumen tank, provides a drying action for the aggregate. If desirable, bitumen may be circulated when machine is not mixing.

Bulletin MP-51, giving specifications, flow diagram and complete information, will be sent on request.

H&B ESTABLISHED 1892

HETHERINGTON & BERNER INC., 735 Kentucky Avenue, Indianapolis 7, Indiana

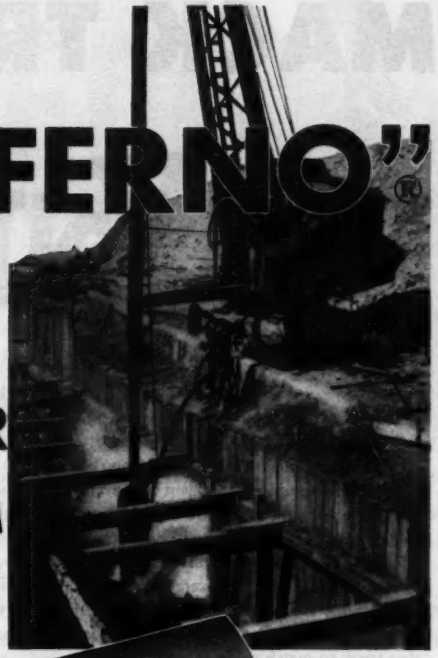


VERSATILE MAGNET — Complete new line of hand-operated, load-releasing tubular Magnetools is used for entering small openings, such as blind holes, around machinery, conveyors and benches. Also usable for removing metallic sludge from coolant tanks and boring into tumbling media or carburizing materials to remove parts. Permanent, not electric, they are said to be resistant to water, oil and gasoline. Diameters range from 1/16 in., to 2 5/8 in.— **Multifinish Manufacturing Co., Dept. 566, Detroit 7, Mich.**

LIFE-SAVE VEST—Here is a new type vest, especially designed for bridge workers, dock workers, shipbuilders and others working above water, where the danger of drowning is ever-present. The vest's outside covering is a strong, closely-woven drill cloth; filling is of high quality kapok, having a buoyancy of 30 to 35 times its own weight. The vest has been designed to permit free use of arms, and is well ventilated and practical for year-round use. Workers who have tried the vest say that the flexible waist line assures fit and comfort when bending over or sitting down. There are no metal parts to corrode or rust, and the garment is colored orange for high visibility. Complete information obtainable from—**Industrial Products Company, 2989 N. Fourth St., Philadelphia 33, Pa.**

"INFERNO"®

PILE DRIVER STEAM HOSE



Sizes: ½" to 2" in Maximum Lengths of 50'

"Standard of Quality"

"INFERNO" . . . the name to remember when you need hose for pile driving or any other heavy-duty steam service . . . the hose with a reputation for outstanding safety and durability under severest working conditions. A Goodall "Standard of Quality" product, recommended for pressures up to 200 lbs. and temperatures to 400°F.

The tube of "INFERNO" provides remarkable resistance to hardening and cracking under high temperatures. Tightly braided galvanized steel wires reinforce the rugged heat-resistant carcass. The tough red cover withstands hard abrasive wear and all kinds of weather. Despite its powerful construction, it has good, long-lasting flexibility.

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MACK TRUCKS

See You Through

• There are many good reasons why a Mack is your best truck investment during times like the present. Most important of all is the undisputed fact that Mack trucks outlast them all.

This means that with a Mack truck you can face the uncertainties of the future with assurance...confident that even if trucks should become hard to replace your Mack will see you through...that it will stay on the job delivering dependable service mile after mile and year after year.

Thousands of truck users in World War II found out by actual experience that they were indeed "Lucky to own a Mack." Whatever the future may bring, you'll find that for a sound investment in long-term reliability and operating economy there's no other truck to match a Mack.

Your nearest Mack branch or distributor will give you the full story on what "Built Like A Mack" means in *extra* long life, *extra* strength and stamina, *extra* performance and *extra* dependability.

Mack TRUCKS

...outlast them all

Mack Trucks, Empire State Building, New York 1, N.Y. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

In punishing contracting service Mack trucks "see you through" with long-lasting dependable operation. This Model LJ six-wheel Diesel Mack serves D'Addario Contracting Co. of Bridgeport, Conn.

Announcing the

CLECO

RC-50

PAVING BREAKER

A light-weight, 50-pound paving breaker that has the power of many heavier breakers

Light enough to be handled by one man in horizontal or overhead work, this general utility demolition tool is adaptable to a wide range of uses. It is especially suitable for brick work, asphalt cutting and shop maintenance work.

Heart of the Cleco RC-50 is the same type Reed-Cleco valve as that used on the RC-80. This valve gives full control of both power and return strokes . . . assuring hard, uniform blows, fast action, minimum recoil, no short-stroking, and low air consumption.

Despite its light weight, the Cleco RC-50 is extremely rugged. Wear resistant alloys, automatic lubrication and heavy-duty construction assure long life and low maintenance cost.

Write for Bulletin RC-949.

CLECO

No. 183-A AIR-OPERATED

PORTABLE SUMP PUMP

Capacity, 340 gpm at 10 ft. head, 124 gpm at 70 ft. head • Weight only 56 lbs. • Requires no priming • Available in steel or bronze construction • First choice of production-minded contractors.

Write for Bulletin SP-849.

CLECO AIR TOOLS

DALLETT

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of the REED ROLLER BIT COMPANY, 5125 Clinton Drive, Houston 20, Texas, U.S.A.

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America's largest-selling **DROP-FORGED** *fasteners!*

SIZES for ¼" to 3" WIRE ROPE
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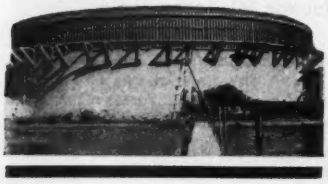
STEEL Forms—good for reuse again and again without repair—cut material costs far below wood. SPEED forms cut job time—contractors report savings of 1/3 to 1/2 on all types of construction. Glad to give you layouts, cost studies and complete facts—No obligation. Just send prints of the job to Dept. MC and ask a representative to call.

IRVINGTON FORM & TANK CORP.
20 Vesey Street, N. Y., N. Y.



ARC DRIVE CONTROL—This device permits the operator to adjust the arc characteristics of the welder to suit particular jobs. Operates automatically, providing an extra surge of welding current at the exact moment the arc becomes shorted, either by direct contact between the electrode and the work or by a globule of molten metal bridging the arc gap. This extra surge prevents arc outage or sticking of the electrode and helps clear the arc path. Violent or prolonged over and undershoots, characteristic of rotating-type welding generators, are eliminated, the manufacturer claims. A self-heating thermostat prevents overheating due to sustained short circuits of the welding terminals. — **Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.**

MOTOR-DRIVEN TROLLEY—The outstanding feature in this new motor trolley is a fluid coupling which completely replaces expensive accelerating speed controls, lowering the usually high maintenance cost of this particular piece of equipment. The motor in the new Yale trolley starts unloaded and comes up to 85% of full speed before starting the load. There is, therefore, no prolonged inrush of current. Also no metal-to-metal contact in the coupling itself, therefore there is no wear. Maintenance requirements are only

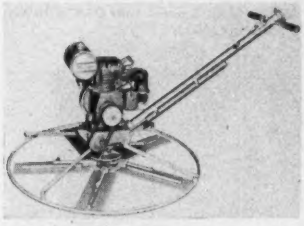
America Needs Steel —and *YOU* can help!

America is sending out an urgent call for scrap! The greatly increased steel production necessary to meet today's emergency is requiring more scrap than it is getting—much more. Here's where you can play an important role. Look around your plant. Chances are, in some half-forgotten corner, there's a pile of idle, dust-covered steel scrap. Organize a salvage program . . . see that this vital material gets back to the mills. Take part in America's future—*get in the scrap!*

LACLEDE STEEL COMPANY
St. Louis, Mo.

an occasional check of oil level. Since the motor starts free of any load and is loaded gradually by the fluid coupling, acceleration is smooth and gradual without vibration or jerking. This greatly reduces swinging or pendulum action by the load, and with this feature open containers of liquid are not as likely to spill. The motor also eliminates the need for a motor brake on the trolley.

Available from ⅛- to 12-ton capacity, it can fit the usual range of track sizes for which Yale hoists and trolleys are available.—**(Philadelphia Div.) Yale & Towne Manufacturing Co., 11000 Roosevelt Blvd. Philadelphia 15, Pa.**



5-BLADE FLOATING AND FINISHING MACHINE—There are five rotating trowels instead of the conventional three on this Model C concrete floating and finishing machine, making it possible to move in on a wet slab much sooner. Trowels need not be changed—merely adjust the pitch of the blades for either operation by a new adjustment on the trowel arm.

This trowel pitch, as on other Whiteman rigs, can be changed while the machine is working by merely turning a knob on the end of the shaft. The guard ring permits finishing to within 1½ in. of walls, curbs, columns, etc. Two belts and a double-groove clutch increase trowel speed by 25%.—**Whiteman Manufacturing Co., 3249 Casitas Ave., Los Angeles 39, Calif.**

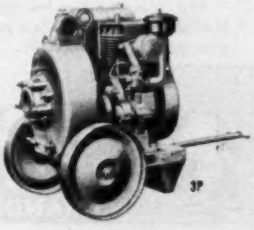
STEEL RULE—"Accurate measurement even in the dark" is the claim Master Rule Co. makes for its multi-purpose streamlined steel measuring tape. By butting the right-angle tip of this tape against one wall of a space to be measured, then extending the tape until the straight-sided case is flush against an opposite wall, a flick of the locking lever positively retains the measurement. The case may then be moved into the light and measurement read directly at the top of the case without any computation. It lists graduations on both sides and has a decimal equivalent chart. It may be used for inside or outside measurement, height or depth gage, outside caliper measure, or flush for layout work. Available in 6-, 8- and 10-ft lengths with either etched blue steel or easily read black-on-white tapes.—**Master Rule Mfg. Co., Middletown, N. Y.**

a JAEGER never races to prime

*Dewatering 1500′ of 8′ x 14′ deep sewer trench at a river crossing, this 4″ Jaeger pump handled 40,000 gph at an average speed of only 1200 rpm (10% to 15% lower speed than other pumps), and reprimed quickly, as needed, at 1400 rpm (compared with 1800 to 2000 rpm required to prime ordinary pumps).

Pump longer because they pull stronger at easy speeds

Jaeger "Sure Prime" Pumps are built oversize with larger shells and impellers, and generously powered. They hold more priming water and are subject to less abrasive wear. Exclusive double priming action is fast, dependable, without harmful racing of engine. No vapor lock even when pulling high vacuum on long intake lines—sustained efficiency on non-stop pumping, and thousands of extra hours of service from both pumps and engines.



Other sizes 1½" to 10"

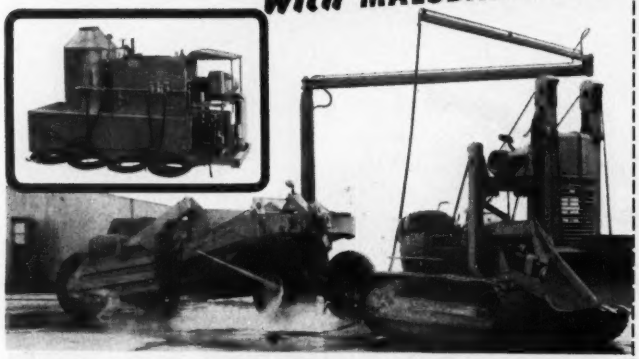
See your Jaeger distributor or send for Catalog P-10

THE JAEGER MACHINE COMPANY

800 Dublin Ave., Columbus 16, Ohio

COMPRESSORS • MIXERS • HOISTS • TOWERS • PAVING MACHINERY

CLEANS TRACTOR IN 1 TO 3 HOURS *with* MALSBARY 500



SUPERHEATED SOLUTIONS...
pressures to 400 lbs., blast dirt and cleaning costs.

Peterson Tractor & Equipment Co., San Leandro, California, use MALSBARY high pressure cleaners exclusively. They clean tractors for painting and overhaul in 1 to 3 hours—a job that requires 4 to 8 hours with limited lower pressures developed by conventional steam cleaners.

You save up to 40% of mechanics' time because you eliminate grease wiping and dirt scraping on surfaces cleaned the MALSBARY way.

CHECK THESE 4 MONEY-SAVING FEATURES

✓ **EXCLUSIVE PATENTED PUMPING SYSTEM** replaces steam as source of working pressure on MALSBARY high pressure Models 250, 300 and 500. Cleaning efficiency is not limited to steam formed in the coils.

✓ **PRESSURES TO 400 LBS.** This is 2 to 4 times higher than steam vapor cleaners; enables MALSBARY to do jobs other cleaners cannot touch.

✓ **5 DISTINCT CLEANING ACTIONS.** High pressure steam cleaning; high pressure hot water; high pressure cold water; low pressure wet steam; and low pressure warm water. Only MALSBARY offers you all 5.

✓ **GADGET-FREE CONSTRUCTION.** MALSBARY cleaners are simple, rugged and dependable, present practically no service problems; require no trained "technicians" to operate. Backed by 30 years' experience.

High pressure models 250, 300 and 500 offer you choice of 1 to 4 cleaning guns; volumes of 300 to 2100 gals. per hour; temperatures to 325°F. All develop hot solution in 2 to 3 minutes; are available with oil or gas-fired burner; stationary, portable or trailer mount.

You, too, can get the same efficient action that Peterson gets with MALSBARY cleaners. See for yourself. Check coupon for free demonstration and mail it NOW.

MALSBARY
SINCE 1921 MANUFACTURING CO.

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California

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☐ FREE BOOKLETS ON MALSBARY CLEANERS.
☐ ON-THE-JOB DEMONSTRATION.
☐ NAMES OF NEARBY MALSBARY USERS.

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Business _____

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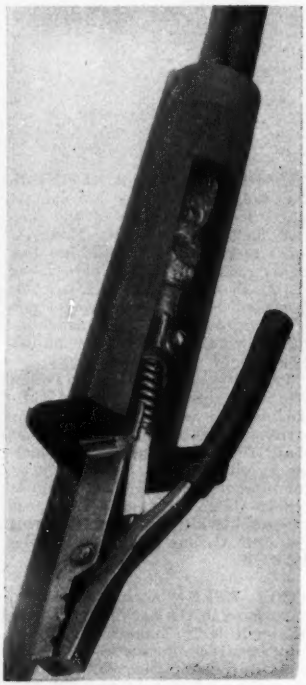
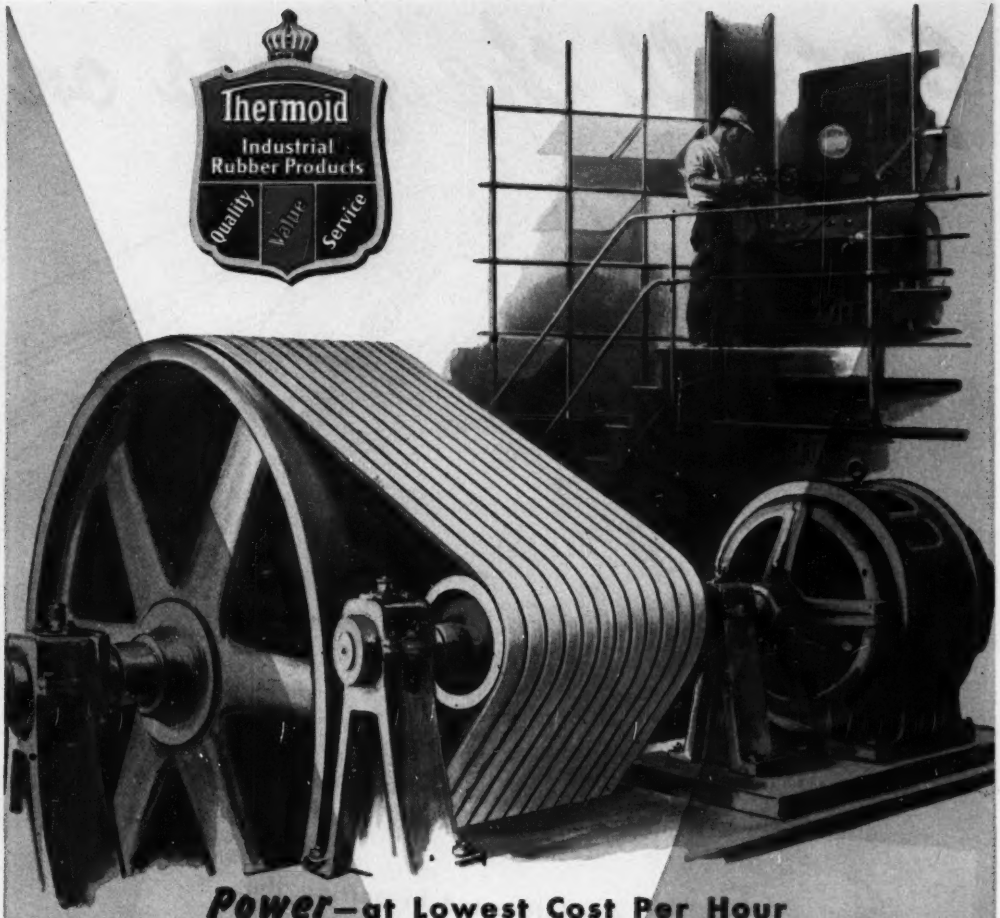
around the usual cycle of declutching, shifting of gears, and clutching. Trucks pull away from a loading shovel in the gear ratio they will use up the entire grade. The automatic torque converter brake, designed to exert braking effort in excess of engine rated hp, is rated to perform 90% of the braking job in returning to the bottom of a pit, according to the manufacturer. This brake reduces the air demand on the engine air compressor and prolongs wheel brake life, according to conclusions of several tests. The operator's control valve is equipped with four selections: (1) neutral, (2) torque converter drive, (3) mechanical drive, and (4) combined engine and hydraulic braking.—**Twin Disc Clutch Co., Racine, Wis.**



ELECTRODE HOLDER—Latest in the lines of Caddy welding accessories is this Type A electrode holder, featuring the welding cable connected by the Cadweld Process, available in 300 and 500 amp capacity. Features include a spring assembly engineered to give a uniform pressure when inserting or ejecting electrodes and a handguard that protects the welder's hand from spatter, arc and reflected heat. The manufacturer claims that its deeply grooved jaw has a maximum rod grip, and the enclosed coil spring assembly cannot be damaged by arcing or spatter.—**Erico Products, Inc., 2070 E. 61st Place, Cleveland 3, Ohio.**



Power—at Lowest Cost Per Hour with Thermoid Multi-V Belts

Thermoid Multi-V Belts are pre-stretched to insure maximum power transmission without adjustment. They are constructed for flexibility and ability to absorb repeated shock loads . . . thoroughly impregnated with special rubber compounds to withstand moisture and abrasion, resulting in longer belt life.

Thermoid Multi-V Belts are available in matched sets—uniform in size and cross section. Their longer life and non-slip performance add up to "Power—at the lowest cost per hour."

Your Thermoid Distributor can help you with your power belting problems—whether you need Multi-V, F.H.P. or flat transmission belts. For unusual belt problems, a Thermoid Field Representative is always available to give you the benefit of his experience.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

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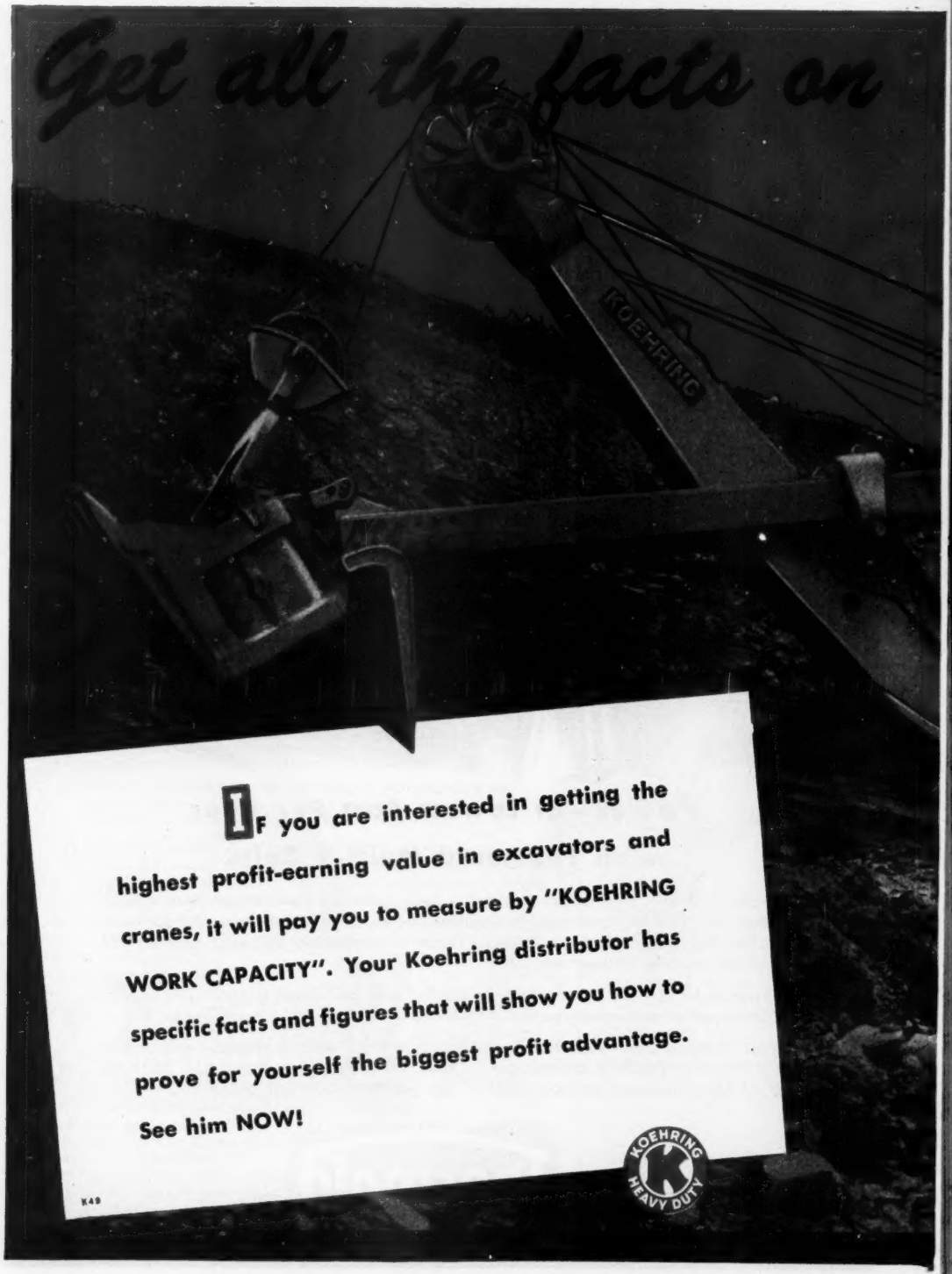
Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah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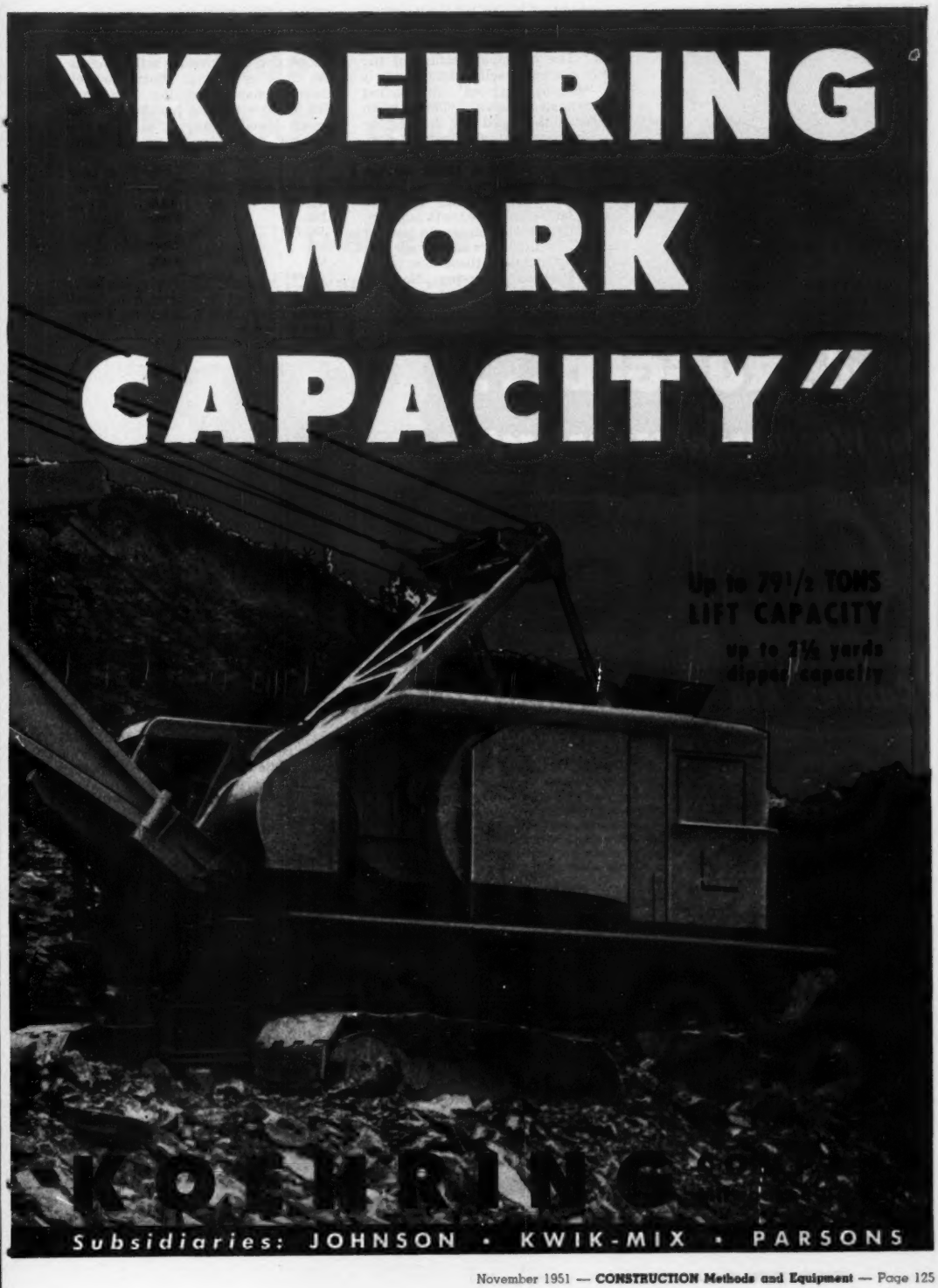
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WORK
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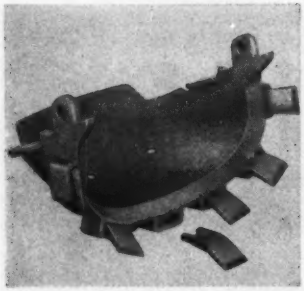
up to 2½ yards
dipper capacity
KOEHRING
Subsidiaries: JOHNSON • KWIK-MIX • PARSONS



TAP-IN BUCKET TEETH—The development of tap-in bucket teeth as standard equipment on all Trenchliners is announced by the manufacturer. The principal feature of the newly designed, self-locking tooth is the "easy-in, easy-out" time-saving replacement involved. These teeth eliminate the need for bolting or crimping edges to hold teeth in position. A precision-fit taper locks the tooth firmly in place either on the bucket or sidecutter bars. Tooth holders are cast integrally with the bucket lip for positive tooth support. By welding small adapters to present buckets, Trenchliners of any age can be converted to use these new teeth. **—The Parsons Company, Newton, Iowa.**

FORK-LIFT TRUCKS — Three of Towmotor Corp.'s five new fork-lift trucks replace three formerly produced, and they feature solid or cushion tires, as well as shorter wheelbase for maneuverability. The other two models feature pneumatic tires on all wheels, bringing to three the number so equipped by the company. They are:

Model	Wheelbase	Capacity	At Load Center
480-P*	48 in.	4000 lb.	24 in.
390	39	3,000	15
400-P*	40	2,000	24
420	42	4,000	15
460	46	4,000	24

** Pneumatic tires throughout*

Write for full information to **Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.**

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for Weather-Wise Contractors

The ALL-NEW
Canvas Kid Contractor Tarp

WINDBREAKS curb costly work stoppages that defeat construction deadlines. Protect men on the job with rugged Canvas Kid windbreaks. "Extra strength" features built right in at no extra cost:

- Double-locking Spur-Type Grommets
- Grommets spaced 3 ft. apart.
- Hemmed all four sides

TARPAULINS. Unprotected materials enroute or on the job invite damage and waste. Cover materials with all-new Canvas Kid tarpaulins. Order winter supply now and protect your investment. Water-Repellent Treated, Flame-Resistant Treated, or both.

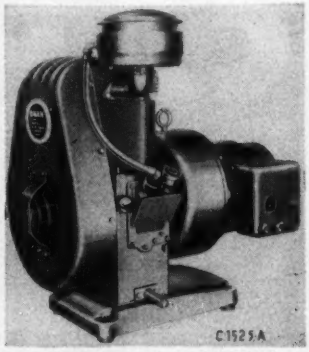
NEW PACKAGING — Waterproof cover for safety in shipping and storage.

ASK YOUR EQUIPMENT DISTRIBUTOR!

CANVAS KID "CONTRACTOR" TARPS

Standard sizes in flame resistant treated, water repellent treated, or both, are available through your equipment distributor. For special size tarp requirements ask your distributor or write direct to:

CANVAS PRODUCTS CO. 615 RUTGER ST. ST. LOUIS 4, MISSOURI



DIESEL ELECTRIC PLANT — Here is a 3,000-w diesel electric plant, powered by an air-cooled, full-diesel Onan engine. Push-switch control for electric cranking, manual compression release, and an electrically heated glow-plug for cold weather starting are provided. The manufacturer says that only 0.155 gal of low-cost furnace oil is consumed per kwhr at full rated load. It generates 115-v, 60-cycle, single-phase current. Other ac models available in single phase produce 230 and 115/230 v. A 32-v battery-charging model also can be supplied. All models have ample overload protection.**—D. W. Onan & Sons, Inc., University Ave. S.E. at 25th, Minneapolis 14, Minn.**

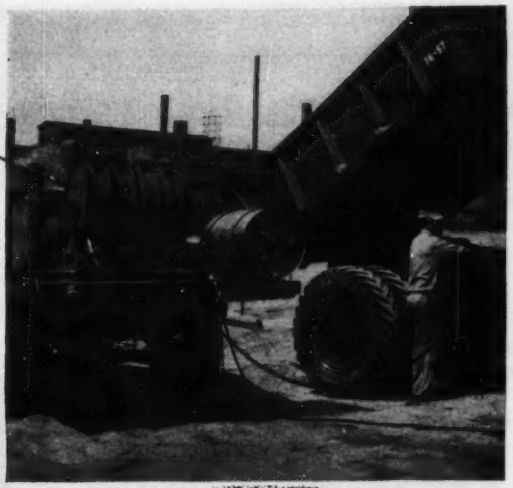
TAPE HOOK—This handy tape hook is designed for ready attachment to any Starrett ¼- or ⅜-in. wide steel tape and, when used, greatly facilitates unassisted measuring of long pipe, casings, steel sheets, lumber and similar materials. The hook is made from a brass casting with nickel-plated finish, and the inner surface of the hook is serrated for a secure grip. It is so designed that the end of the tape aligns with and takes the measurement from the inside of the hook. The ring provides a convenient finger hold at the end of the tape as well.**—The L. S. Starrett Company, Athol, Mass.**

MOST IMPORTANT RIGS

on any job!

GRACO'S *NEW* LUBE RIGS

Keep costs down . . . yardage up!

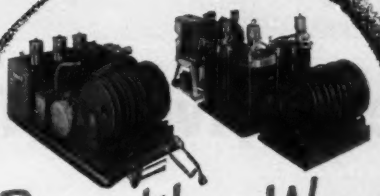


THE OLD "GREASE TRUCK" has a new look these days. Smart contractors are replacing old wasteful, makeshift methods with modern truck mounted lube rigs.

Recently re-designed and improved, Graco Convoy Lubers now feature the toughest lubricant pump ever developed for contractors' service . . . the Graco air-operated Mogul. You can get either original drum or hopper models.

The Mogul pump, available in pressure ratios of 40 to 1 and 8 to 1, is heavy-duty built to work shift after shift without attention.

Don't let improper greasing cause costly down time. Give your equipment the best care possible . . . grease, oil and air from a new Graco Convoy Luber. Send the coupon below for the new 24-page color catalog. It's yours free!



Buy either Way!

You can get Graco Convoy Lubers in either of two types: Self-contained, skid-mounted Convoy Lubers (left) are ready to slide on a truck and head for the field. New Convoy Luber catalog describes these units fully.

Job-planned Convoy Lubers (typical rig at right) are build-your-own units, designed by you to meet your own special requirements. Any combination of pumps, reels and other equipment you want. Charts in the new Convoy Luber catalog help you select the component parts. Catalog also gives suggestions for various combinations, plus information on all pumps, reels and accessories.

GRACO

Convoy Lubers

***Product of* GRAY COMPANY, INC.**

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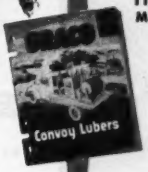
Sales and Service in all principal trading areas of the United States, Canada and foreign countries. District offices: New York, Philadelphia, Detroit, Chicago, San Francisco, Atlanta (opening January 1).



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● Please send me the new 24-page Convoy Luber Catalog for contractors,

Name.....

Company.....

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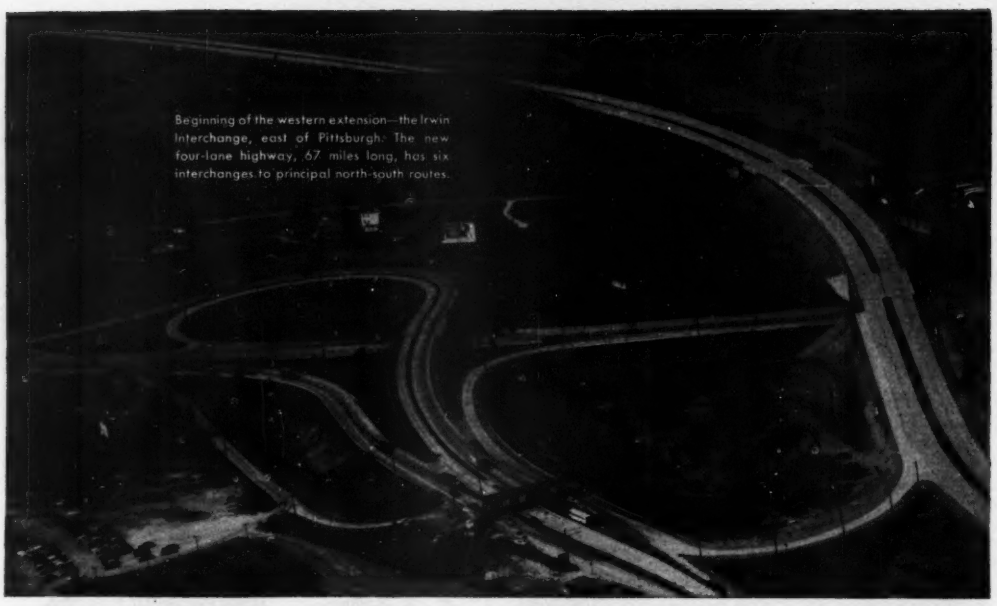
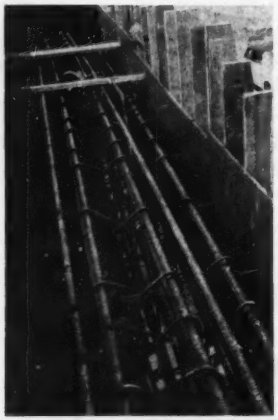
City.....Zone...State.....



Beginning of the western extension—the Irwin Interchange, east of Pittsburgh. The new four-lane highway, 67 miles long, has six interchanges to principal north-south routes.

Pennsylvania Turnpike Goes West



F. Y. Dunn (left), resident ▶ engineer, Pennsylvania Turnpike Commission, and W. S. "Buckets" Bell (right), paving superintendent, talk over the job with Contractor Frank Mashuda.

◀ Close-up of Bethlehem Reinforcing Bars installed in bridge. Bars have high, closely-spaced lugs to prevent slippage in concrete.

▼ Graded surface is dampened before first-course pouring. Bethlehem Dowel Unit, in foreground, keeps dowels accurately aligned in concrete, horizontally and vertically. Hook bolts visible at left.

WITH the opening of the western extension of the Pennsylvania Turnpike System, motorists now may enjoy 327 miles of uninterrupted express-highway driving from King of Prussia, near Philadelphia, to the Ohio border.

Smaller pictures here show construction on a portion of the Turnpike north of Pittsburgh. The contractor was Frank Mashuda Company, Milwaukee. Bethlehem, well represented along the entire Turnpike, supplied dowel units, bridge reinforcing and hook bolts.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast, Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail
Guard Rail Posts • Wire Rope and Strand • Pipe
Hollow Drill Steel • Spikes • Bolts and Nuts
Timber Bridge Hardware • Tie-Rods
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BETHLEHEM STEEL

LOOK TO P&H FOR THE BIG 3

1 Greater Stability

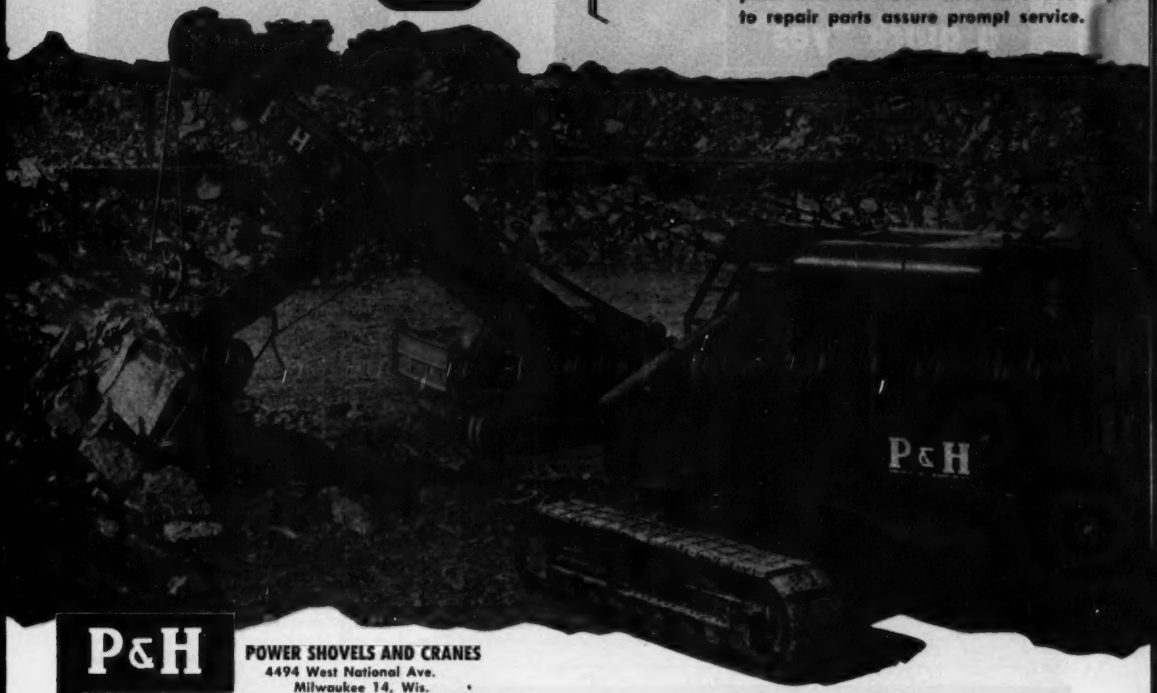
gives you more digging power at the tooth point — without tipping strain.

2 More Modern Design

True tractor type crawlers reduce maintenance; *live roller circle* gives livelier swings; *low pressure hydraulic control* is faster, smoother; *all-welded construction* means greater strength.

3 Better Service

Adequate dealer parts stocks are supplemented by 20 strategically located branch offices and warehouses. One complete plant and warehouse devoted exclusively to repair parts assure prompt service.



P&H

POWER SHOVELS AND CRANES
4494 West National Ave.
Milwaukee 14, Wis.

HARNISCHFEGER CORPORATION

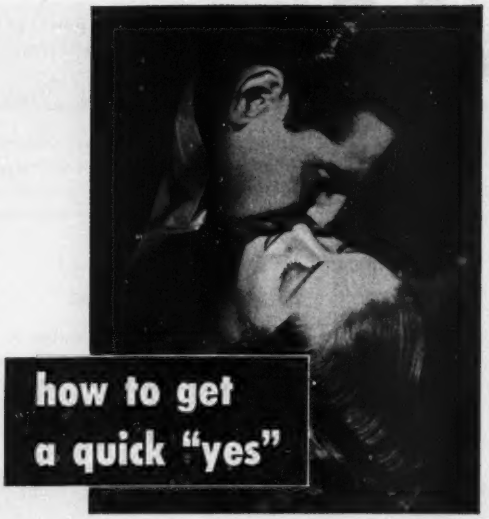
See your P&H Dealer

P&H Excavators and Truck Cranes are more easily converted for the various types of service shown below — with hoist and digging drums on one shaft, the need for auxiliary shafts and gearing is eliminated. You also have a choice of gas, Diesel or electric power. Ask for literature on the size you need.

the P&H Line

SHOVEL · DRAGLINE · BACKFILLER · CRAWLER CRANE · MAGNET CRANE · TRENCH HOE · PILE DRIVER · TRUCK CRANE

POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PULP-MILL HOISTS



Do architects, engineers and contractors know the exact capacity of any standard paver or mixer that pours their jobs today?

The answer is a quick and positive "Yes." Uniform drum sizes have been established and proper mixing capacities guaranteed by AGC Rating Plates. Always look for the AGC Rating Plate when you buy.

Mixer Manufacturers Bureau

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CONSTRUCTION MACHINERY CO., Waterloo, Iowa
THE FOOTE CO., INC., Nunda, N. Y.
THE JAEGER MACHINE CO., Columbus, Ohio
THE KNICKERBOCKER CO., Jackson, Mich.
KOEHRING COMPANY, Milwaukee, Wis.
KWIK-MIX COMPANY, Port Washington, Wis.
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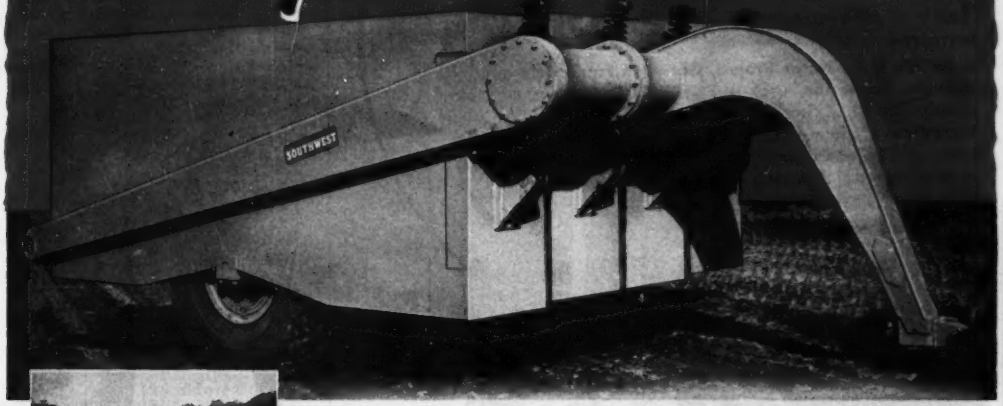
PORTABLE CRUSHING-SCREENING PLANT—Built around a DODD triple jaw crusher with a jaw opening of 11x24 in., this new portable unit has been designed for rock and/or gravel operations. Material is fed from a scoop which can be loaded at ground height. The sizing screen is a double-decker. It can be set to remove both fines and oversize or can be adjusted so that all the material is delivered to the loading conveyor. This Dodd plant is 25 ft long, 92 in. wide, 8 ft high, and weighs 16,000 lb. Rated capacity is 30 tons/hr of 1½-in. stone. Safety springs compress if tramp iron gets into the crusher, eliminating costly downtime.—**Union Boiler & Manufacturing Co., Lebanon, Pa.**

CAR PULLER—There's no need to have an engine and crew on the job to shuttle and relocate freight cars during unloading and loading operations. You don't even need a high-priced operator on an expensive tractor or rubber-tired pusher of some kind. Instead set up a drum-type car puller with two lines, as pictured above. One line is hooked directly to the side of the car; the other passes through an anchor block at the far end of the run and back to the same car fitting. In this instance two different sizes of aggregates were loaded into opposite ends of gondola cars, although delivery came alternately through one common outlet chute. Models vary in size and power for different jobs.—**American Hoist & Derrick Co., Saint Paul 1, Minn.**

RUBBER TRAFFICONES CHANNEL VEHICLES — Though they're made of heavy rubber, these cone-shaped traffic barriers and channelers have the appearance of steel and command a lot of respect from motorists and truckers alike. Contractors, utilities, school and police departments are pleased with their minimum storage space, ease of handling, and no breaking or distortion. A main Trafficone barricade stands 40 in. high with its sign and weighs 6½ lb. Cones themselves are 18 in. high, weigh only 2½ lb.—**Interstate Rubber Products Corp., 908 Avila St., Los Angeles, Calif.**

SOUTHWEST Compaction Roller



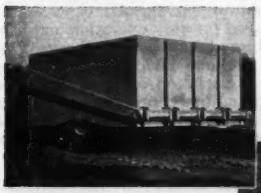
Note how every print of each tire tread is uniform in depth and shape.

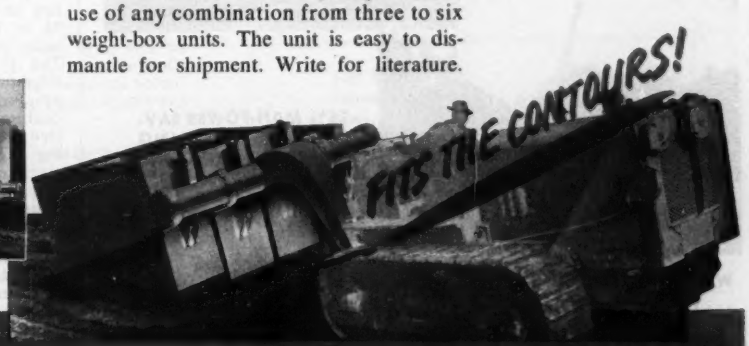
The weight-box units are hinged at the rear and oscillate independently.

For compacting earth fills!

UNEVEN GROUND CONTOURS cannot reduce the efficiency of the new Southwest Compaction Roller. As it travels over the variable surface of the earth fill each weight-box unit with its own wheel and tire oscillates independently up and down. Compaction is positively uniform because the weight on each tire remains constant—there is no bridging and no sudden shifting of load from tire to tire.

The sectionalized tubular yoke permits the use of any combination from three to six weight-box units. The unit is easy to dismantle for shipment. Write for literature.





CONSTRUCTION MACHINERY DIVISION

Southwest Welding & Manufacturing Co.

Alhambra, California

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ARE YOU GETTING SAVINGS LIKE THESE?

Here's a contractor who *is* . . with a MICHIGAN Truck Excavator-Crane.

On the Elk River Bridge Project, Garrett & Farris Company of Knoxville, Tennessee, uses it's MICHIGAN to pour concrete . . strip forms . . . charge the batcher . . . excavate for pier foundations . . . load materials at a rail siding four miles distant and unload back at the job . . . sort pilings and supply the pile driver . . . position the pile puller when needed . . all in a day's routine.

And look at some of the savings:

ONLY 3 MEN NEEDED ON BATCHING AND POURING.

A HALF-HOUR JOB THAT FORMERLY TOOK HALF A DAY . . . here the MICHIGAN reduces labor costs 80%.

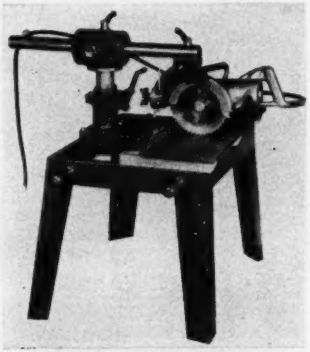
75% MAN-POWER SAVINGS BY HANDLING STRIPPED FORMS with the MICHIGAN.

When it's versatility and savings you want . . . investigate MICHIGAN . . . you'll agree it's your best buy!

MICHIGAN POWER SHOVEL COMPANY

495 Second Street, Benton Harbor, Michigan, U. S. A.

CONDENSATION RETURN UNITS—Known as "Motor-Mount," these new units effect a considerable saving in fuel by returning condensate from steam coils, radiators, or steam-operated equipment back to the boiler. The complete line includes single and duplex units—the duplex units designed for conditions involving occasional demands in excess of the capacity of a single unit, or where a standby pump is desired to assure continuous operation under all conditions. There is selection of 44 unit numbers in both single and duplex units designed to handle from 2,000 to 40,000 sq ft of radiation—**The Deming Co., Salem, Ohio.**



PORTABLE ELECTRIC HANDSAW—An electric portable handsaw can be mounted in a few seconds to this new retractable radial arm as shown above. Complete with column, portable base and hardwood table, the Comet Radial Arm quickly increases the utility of the saw for mass production jobs such as trimming studs, cutting rafters, etc. It has an ample cutoff movement of 24 in. Bevel range is 0 to 45 and miter range 45 deg to right or left. The vertical column adjusts to a height of 9¾ in. All controls are grouped for easy operation and have calibrated settings for all cuts. Positive locking devices prevent creeping or variation between cuts. Special mountings and pressed steel legs extra—**Consolidated Machinery & Supply Co., 2031 Santa Fe Ave., Los Angeles, Calif.**

FIRE-RESISTANT WALLBOARD—By combining unexpanded vermiculite and gypsum, a new wallboard has been produced with high fireproofing quality, usable for both commercial and residential construction. The wallboard comes in three thicknesses, ⅜, ½ and ⅝ in. Underwriters Laboratories Inc. has given a 45-min fire rating on walls and ceilings for the ½ in.; 1 hr for walls where the ⅝ in. stock is used on both sides of a load-bearing wood stud partition. It's applied like regular gypsum board.—**Zonolite Co., 135 S. LaSalle St., Chicago, Ill.**

This 144-page book shows over 5,500 on-the-job truck running cost reports . . . from owners in every state in the U.S.A.

Here's *another* Ford first! New "Final Results" record, based on over 5,500 running cost reports, lets you check what truck running costs can be in over 195 different jobs!

50 million mile Economy Run shows HOW LITTLE IT COSTS to run a FORD TRUCK in your kind of work!

● The purpose of the Economy Run was to give businessmen and truck operators dependable truck running cost figures, based on actual trucks working on actual jobs. These figures are published so that you can:

SEE before you buy, just how little it *does* cost to run Ford Trucks.

SEE what size trucks cost the least to run in various kinds of work.

SEE how your running costs compare with others in your kind of work.

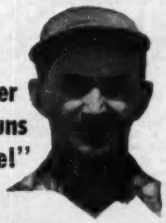
Are all running cost figures included? Yes! The "Final Results" book shows all gas, oil, maintenance and repair costs reported by users of 1948, 1949 and 1950 model Ford Trucks.

Can this book help YOU? Yes! It is a service to businessmen which may save you real money. It gives you a standard of comparison on one of the big expense items in your business.

What does the book show? The Economy Run book shows that in your kind of business, even the biggest Ford Trucks haul for only a few pennies a mile, and that *all Ford Trucks cost downright little to run.* See the book at your Ford Dealer's today!

ROY GEETING,
Construction Man,
Eaton, Ohio, says:

"My Ford hauls over 6 tons of gravel—runs for only 3 1/10¢ a mile!"



Mr. Geeting was one of over 250 Heavy Construction Men, shown on pages 43 to 46, who took part in the Run. His Ford F-6 Dump traveled 21,003 miles at a cost of $639.83 for gas, oil, maintenance and repairs. Check *your* truck running costs with those of other heavy construction men whose loads and working conditions are similar to yours!

For the right truck for your job . . .

See your Ford Dealer today!

See "Ford Festival" starring James Melton on NBC-TV.

WELLMAN
easy handling of large stones

● Those big stones won't slip from the Wellman Stone Grab. Four-part closing cable reeving develops tremendous closing force on stones. Model shown has 5-ton capacity, 4½ foot jaw spread. Other capacities available.

Want Facts?
Send for free descriptive bulletins.

THE WELLMAN ENGINEERING CO.
7000 CENTRAL AVENUE • CLEVELAND 4, OHIO

STONE AND WOOD GRABS • CLAMSHELL, DRAGLINE, CUSTOM-BUILT BUCKETS

SELECT A *Sterling* THAT FITS YOUR JOB!

TUBULAR STEEL FRAME

(Above)
Model D3½S Maximum Capacity 3½ cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs. V-shaped front braces and brace support.

(Right)
Model C5W Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

12 SPOKE STEEL WHEEL

PNEUMATIC TIRED WHEEL

Shipments as fast as present conditions permit.

There's a Sterling Barrow for every type of hauling job, whether it's dry, bulky materials like sawdust or heavy industrial loads like castings or steel parts. Also special barrows for brick, tile, coal, concrete block and similar materials. All barrows are scientifically designed, well balanced and sturdily constructed for a long service life. Choice of wood handles or tubular steel frame, steel wheels or pneumatics. Write for new Sterling Wheelbarrow Catalog No. 61.

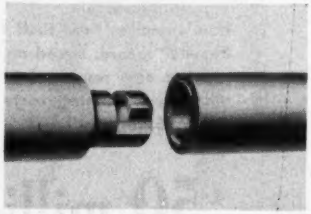
WOOD HANDLE BARROW

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

SWEDISH VISE—Any bench worker who has had to lock a round or tapered object in a vise knows the trouble of getting a tight hold without damaging the work. An ingenious universal screw-vise that instantly clamps round, tapered or irregular objects has just made its appearance on the market. Called the Sevo Vise, its jaws consist of a series of machined and ground flat plates which hinge or swivel in any desired direction to coordinate with the shape of the held object. These jaws are so designed that they can be moved in relation to each other, and the work piece can rest on a contact surface underneath. The locking jaws position themselves when a main screw is turned, and they can then be locked to retain their directional position. The vises come in two sizes, and the distance between jaws is 2½ and 5 in. American distributors are **—De Wilde-Jones, Inc., 181 Steuart St., San Francisco 5, Calif.**



WELDING CABLE CONNECTOR—Device is made of solid brass, machined to a smooth, sliding fit. The design consists of a double cam principle, where one cam exerts pressure parallel to the axis of the connector, the other perpendicular to the axis. Contact approaching the 600 psi needed for minimum resistance is thereby obtained. These CAM-LOK connectors are interchangeable with heavy-duty types and with general-purpose connectors. Long runs of cable can be graduated from 4/0 down to a light Whip End for maximum flexibility and minimum voltage drop. The manufacturer claims that no adapters or reducers are needed with this new type connector. Further details are contained in the company's Technical Bulletin #101-W-13.—**Cam-Lok Div., Empire Products, Inc., Cincinnati, Ohio.**

TRANSFORMER WELDER—Here is a new 200-amp transformer welder designed for general maintenance and production welding. It's a rugged unit with easy-to-operate controls, and is built for long, dependable service in garages, job shops, and industrial plants. An easily read current indicator affords quick adjustment of welding current, according to the manufacturer. Maintenance costs are low because there are no moving parts, he says, and each part is designed for long life under tough operating conditions.—**AirCo Sales, 60 E. 42nd St., New York 17, N. Y.**

Here's Compressed-Air History

IN THE MAKING!

INTRODUCING A NEW ERA OF LOW-COST, HIGH-CAPACITY AIR POWER

Bridge Repair

Street Maintenance

Pile Driving

High Altitude Highway Construction

The Radically New

GYRO-FLOW 600
ROTARY AIR COMPRESSOR

is already proving its worth on all kinds of heavy duty jobs

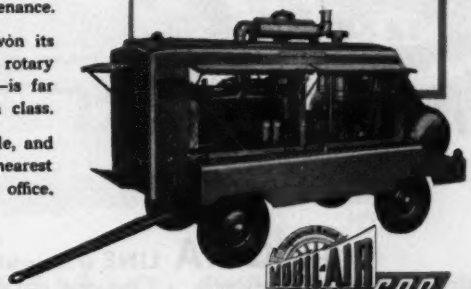
Users say it's by far the most compact and smoothest running 600-cfm Portable they've ever seen. They are amazed at its ease and economy of operation—its smooth, stepless capacity control—rugged simplicity of construction and freedom from maintenance.

Yes, the radically new GYRO-FLOW 600 has already won its service stripes. Field reports prove that its advanced design rotary compressor—without pistons, valves or reciprocating parts—is far superior to anything heretofore available in the 600-cfm class.

For the complete story on this history-making I-R Portable, and the new Ingersoll-Rand FM-3 Wagon Drill see your nearest Ingersoll-Rand representative—or write to our New York office.

No other Portable Compressor like it

- No pistons—no valves—no vibration
- Discharge temperatures do not exceed 200° F. under normal conditions
- Two stage compression with oil injection cooling
- Stepless "Air-Glide" capacity control
- Powerful GM six-cylinder Diesel
- Weighs only 9500 lb. ready to run
- Delivers full 600 cfm at 100 psi



Ingersoll-Rand

11 Broadway, New York 4, N. Y. -623-2

THE LATEST ADDITION TO THE I-R CONTRACTORS' COMBINATION

CONSTRUCTION

THE **IOWA** LINE *of Material Handling Equipment Includes:* ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS • PORTABLE POWER CONVEYORS • PORTABLE AND STATIONARY STONE, GRAVEL AND SAND PLANTS • REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • DRIERS • DUST COLLECTORS HAMMERMILLS • WASHING PLANTS • VIBRATING SOIL COMPACTION UNITS • DOUBLE IMPELLER IMPACT BREAKERS

UNLIMITED

DEMANDS LOW-COST AGGREGATE

OVER $56½ billion backlog is practically unlimited construction! Think of the aggregate needed... of the equipment you'll need to produce your share, and keep costs low!

Whether your job calls for 60 tons an hour... *or 600*... there's a Cedarapids aggregate plant that will turn out the exact quantity and quality you need, at the lowest possible cost per ton.

As a typical example, check the figures of this Concrete Materials & Construction Co. plant, with the Cedarapids 5050 Double Impeller Impact Breaker...

- ✓ **Originally scheduled to produce 400 tons per hour.**
- ✓ **600 tons per hour daily average maintained!**
- ✓ ***724 tons per hour peak production average!***

And here's why you get such low production costs with Double Impeller Impact Breakers...

- ✓ ***Maximum* output of cubical shaped aggregate required in so many specifications.**
- ✓ **Approximately 50% less contact of stone on metal, because such a high percentage of material is broken in suspension.**
- ✓ **You get an extremely high ratio of reduction at extremely low power costs.**
- ✓ **You save on your plant investment because you can eliminate much accessory equipment such as secondary crushers, conveyors, hoppers, screens, elevators, etc.**

Get ready for your share of the big jobs ahead with a Cedarapids Double Impeller Impact Breaker in your plant. "Construction Unlimited" means OPPORTUNITY UNLIMITED for you when you're prepared for bonus production. You can get very prompt delivery on all four sizes of Double Impeller Impact Breakers. See your Cedarapids distributor today for a profitable future.

14,472 TONS! PEAK DAY PRODUCTION FOR THIS CEDARAPIDS DOUBLE IMPELLER IMPACT BREAKER

HERE'S real tonnage! Concrete Materials & Construction Company put through 14,472 tons of aggregate on their peak day, when the surge pile was down and plenty of trucks were available for feed. More and more contractors are depending on Cedarapids Double Impeller Impact Breakers for the bonus production necessary to meet today's unlimited demands for low-cost aggregate!

AVERAGE DAILY PRODUCTION 600 TONS PER HOUR!

Cedarapids

Built by IOWA

Headquarters for

COST-REDUCING EQUIPMENT

U. S. Pat. Nos. 2373691
2486431
Canadian Pat. No. 439371

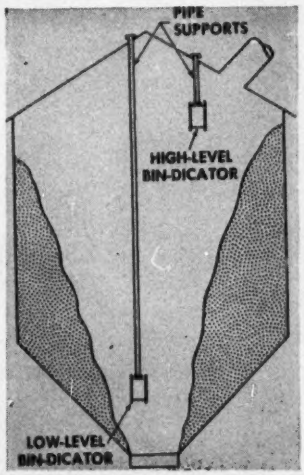
IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

STICK-ON TAPE—Here's a patented, smudge-proof labeling tape available in four colors, six widths and two lengths. It's pressure sensitive and has a special carbon-writing surface sandwiched between two glossy layers of acetate. Write on it with a pencil, stylus, pen—or even a nail—and the carbon adheres to the back of the acetate cover. You can't touch the writing, so you can't rub it off, erase it or smudge it. Because it withstands temperatures all the way from minus 40 to plus 160 deg without losing its adhesiveness or legibility, it's fine for a myriad of jobs. You can also type on it by pressing it on the typewriter platen and typing without the ribbon; it will re-adhere several times. As shown in the picture above, it is excellent for labeling electrical apparatus, fuse boxes, switches, panelboards, etc., and also for identifying wires pulled through conduits. The 8-mm and ⅝-, ¾-, 1- and 1½-in. sizes, and the black, blue, red and green colors allow for numerous coding combinations. All armed services use it, and the Air Force has placed several million-inch orders. Rolls come 400 in. long with dispensers and 800 in. long without them.—**Labelon Tape Co., 100 Anderson Avenue, Rochester 7, N. Y.**

CONCRETE CURING COMPOUND—A new, fast drying, spray-on concrete curing compound has been developed which reportedly will seal effectively 200 sq ft of horizontal surface per gal. Augmenting the line of Permite membrane concrete curing compounds manufactured by Aluminum Industries, Inc, of Cincinnati, it is said to be considerably less expensive than many other concrete compounds now on the market. The company claims that this Permite W-95 meets or exceeds the most rigid specifications of the Army Engineers and other Federal Agencies, as well as most state codes. Its counterparts are Permite V-167, a resin-base curing compound recommended for all horizontal concrete surfaces and for vertical surfaces below ground; and Permite V-169 resin-base for all vertical concrete surfaces where non-discoloration is an important factor.—**Aluminum Industries, Inc., 2438 Beekman St., Cincinnati 25, Ohio.**

3 IMPORTANT REASONS FOR STANDARDIZING ON VICTOR WELDING AND CUTTING UNITS
VICTOR
Welding and Cutting Equipment Since 1916
REGULATORS for
acetylene
carbon dioxide
compressed air
hydrogen
liquid petroleum gases
medical gases
oxygen
TORCHES for
air gas
brazing
bunsen burner
descaling
flame cutting
flame hardening
hand cutting
heating
lead burning
machine cutting
preheating
soldering
surface hardening
welding
WELDING ROD
for all uses
HARD-FACING
alloys
BLASTING nozzles
PNEUMATIC
regulator-filter-lubricator
CYLINDER MANIFOLDS for
all types of cylinder gases
CYLINDER TRUCKS
Unlimited Opportunity for Expansion
All VICTOR welding and cutting units handle a wide variety of welding and cutting jobs. To expand them for new needs or special work—descaling, flame cutting, multi-flame heating, priming, etc.—just select the VICTOR tip, nozzle or attachment your job requires.
Low First Cost
When you use VICTOR you keep your investment in line with production . . . you buy only parts or attachments as needed . . . not a whole new outfit.
Low Operating Cost
Finally, because you can use the exact tip or nozzle needed for each job, you get better flame control, use less gas, and do better, faster work.
See for yourself why so many welders say it costs less to own and operate VICTOR. Ask your VICTOR dealer for a free demonstration TODAY.
WC-1 large capacity unit. Cuts metal up to 10" thick; handles all ordinary welding jobs.
WRITE today for descriptive literature and name of nearest distributor.
VICTOR EQUIPMENT COMPANY



BIN-LEVEL INDICATOR—The problem of obtaining dependable level indication in large bins has been simplified by this new Bin-Dicator. It is designed for suspended installation (as shown in the attached drawing) from above, and can be located anywhere in the bin where there will be a free flow of materials to and away from its diaphragm. Flexibility as to location permits the successful application where materials tend to build up on the walls of a bin and flow down through the central area only. The new model indicator, mounted in the area of moving material, gives dependable indication of high and low levels, according to its maker. The unit has been designed to be drilled and tapped to take any size pipe up to 2 in. The support pipe also accommodates electrical wiring, making conduit runs unnecessary. The installation can be easily moved up or down inside the bin to operate at different levels or may be lifted out entirely for inspection. — **The Bin-Dicator Co., 13946-55 Kercheval, Detroit 15, Mich.**

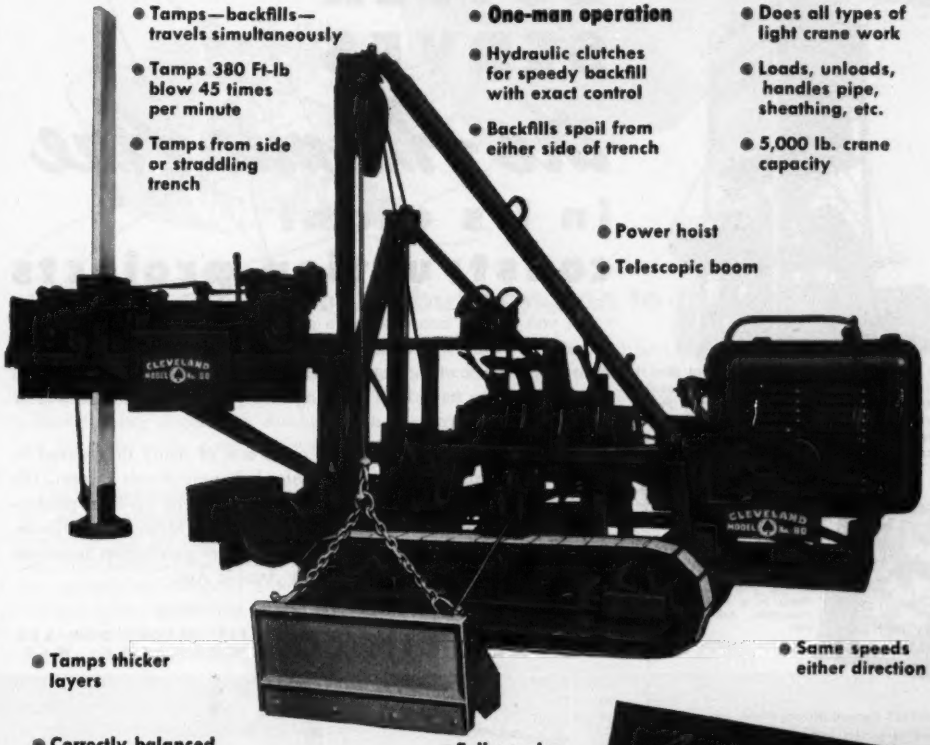
NOW...do all three trench-completion jobs with one machine

CLEVELAND MODEL 80

the only machine of its kind!

IT TAMPS! IT BACKFILLS! IT LAYS PIPE!

- Tamps—backfills—travels simultaneously
- Tamps 380 Ft-lb blow 45 times per minute
- Tamps from side or straddling trench
- **One-man operation**
- Hydraulic clutches for speedy backfill with exact control
- Backfills spoil from either side of trench
- Does all types of light crane work
- Loads, unloads, handles pipe, sheathing, etc.
- 5,000 lb. crane capacity
- Power hoist
- Telescopic boom



- Tamps thicker layers
- Same speeds either direction
- Correctly balanced steel backfill board
- Full crawler maneuverability

A MACHINE THAT BELONGS IN YOUR '52 PLANS

Get more work for your budget dollar! The "80" is time-tested and job-proved—for tamping, backfilling, pipe handling and other types of trench completion work. Get complete information on it *now!*

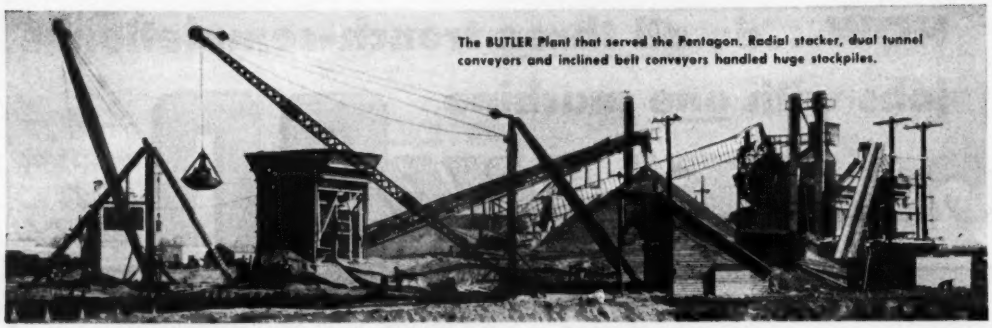
Available Now

Order now for prompt delivery, clean up your back-end problems before winter sets in. The "80" is available 2 ways . . .

WITH OR WITHOUT TRACKS

SEE YOUR LOCAL DISTRIBUTOR OR CONTACT FACTORY DIRECT

THE CLEVELAND TRENCHER CO. 20100 ST. CLAIR AVE. CLEVELAND 17, OHIO



The BUTLER Plant that served the Pentagon. Radial stacker, dual tunnel conveyors and inclined belt conveyors handled huge stockpiles.

This BUTLER veteran served five World War II projects in five widely separate States: Hoosier Ordnance Plant, Lone Star Ordnance Plant, Navy Supply Base, Hanford Engineering Works (Atomic Bomb Plant) and Government Ordnance Plant. In the peacetime years it built a power dam and now, re-designed and improved, is pouring for the Hydrogen Bomb Plant.

A BUTLER Bulletin offered FREE on request has a comprehensive showing of Central Mixing and Ready Mixed Plants in a wide variety of capacities. Ask for Bulletin 260.

BUTLER SERVES *the Atomic Age* in its giant construction projects

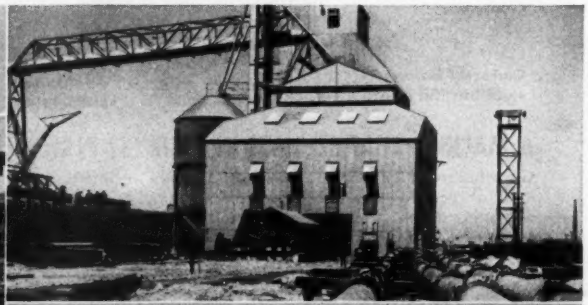
If you will be constructing a gigantic building, a power dam, a modern airfield, an atomic plant — any project that demands an enormous volume of concrete poured in record-breaking time — it will pay you well to have BUTLER engineer and build your Central or Ready Mixed Concrete Plant.

The Butler Plants shown here are a few of many that served in heavy construction such as the Hanford Atomic Bomb project, the Pentagon and large Navy drydocks. They represent top-level production in World War II. Today, new engineering ideas, new methods, new automatic controls, bring you even *higher* production standards in the BUTLER Plants that serve the Atomic Age.

Remember, concrete is as important as armament.

BUTLER BIN CO. 949 BLACKSTONE AVE. WAUKESHA, WIS.

A BUTLER Central Mixing Plant, equipped with front charging mixers and automatic controls, poured the concrete for the Denison Dam.



BUTLER Plants like this built every large Navy Drydock east of the Rockies at speeds up to 400 cu. yards per hour.

"Let the shovel go . . . but hang on to that DIPPER"

When the preference for an Amsco Dipper is so strong that a superintendent at one of Minnesota's largest iron mines quietly removes it from a shovel being shipped to another mine, there are apt to be some good performance reasons why!

The superintendent reported that this AMSCO 6½ yard renewable lip dipper *loaded a record number of tons per 8 hour shift*—more than had ever been loaded before. And, where other dippers needed repairs every 2 months or so, it is still going strong after 6 months of service with no repairs of any kind!

Better design and construction are the reasons for this high production and longer, uninterrupted service. The wide mouth and shallow depth permit faster, easier digging and loading, and a 4-way taper insures clean dumping every time.

And, this dipper is *all-cast*—of tough, work-hardening AMSCO Manganese Steel. The renewable lip and heel plate, when finally worn, are replaceable in a matter of minutes.

Dippers can—and should be—bought with an eye to higher digging efficiency and lower costs per ton . . . and the moral of this actual on-the-job example is clear . . .

WHEREVER YOU MEET A PROBLEM OF WEAR CAUSED BY IMPACT AND/OR ABRASION . . .

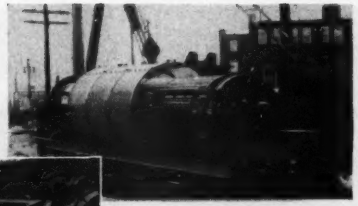
. . . find out about longer-lasting, dollar-saving Manganese Steel Dippers made by AMSCO . . . world's largest producer of manganese steel castings for all industry.

Brake Shoe **AMERICAN MANGANESE STEEL DIVISION**

385 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.
Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

Clean sand, gravel at a cost that doesn't clean your pocketbook



Rely on RELIANCE

UNITS OR COMPLETE PLANTS

Only proper screening and washing can cut costs—and that is where RELIANCE EQUIPMENT makes its reputation. These Units have been greatly improved in the past few years and today many regard Reliance as standard for best results. Let us tell you more about their smooth operation and rugged construction. *Write for Catalog 48.*

RELIANCE PRODUCTS *still available at moderate cost*

Rock Crushers, Bucket Elevators, Revolving Screens, Storage Bins, Pulverizers, Chip Spreaders, Heating Kettles, Bin Gates, Feeders, Belt Conveyors, Grizzlies, Air Separators, Sand & Gravel Spreaders, Wash Boxes.

UNIVERSAL ROAD MACHINERY CO.
KINGSTON, N.Y., U. S. A.
Distributors in all principal cities of U. S. A.

STURDILITE

The HEAVY-DUTY FLOOD LAMP THAT

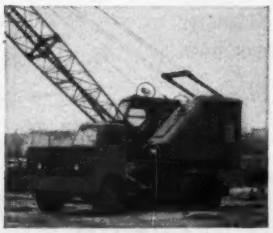
Lights Your Work Better . . . Gives Longer Service at Lower Cost

Vibration-absorbing Base

Specially Designed for Efficient Service on
Shovels — Excavators — Drag-lines
Roadbuilding Equipment
Locomotive Cranes — Tractors

"BUILT to take it," say users of STURDILITE Heavy-Duty Flood Lamps, after years of trouble-free service. Hermetically sealed-beam lamp—no reflector to become tarnished. Complete assembly mounted on rubber cushioned base that absorbs vibration and shocks. Available in 6-8, 12-16, 24-28 and 110-120 voltages.

COMPLETE BULLETIN, specifications, and quantity prices sent promptly upon request.



Metal Spinning Division
PHOENIX PRODUCTS COMPANY
4729 N. 27TH STREET, MILWAUKEE 16, WISCONSIN

NEW EQUIPMENT BRIEFS

New controls for the "Cat" D4 tractor equipped with HT4 Traxcavator now match the higher seat that gives a better view of dig, lift, carry, dump and bulldozing operations. The revised design by **Caterpillar Tractor Co.**, Peoria 8, Ill. allows greater length without interference, for gear shift, flywheel clutch, and steering clutch levers. Operator fatigue also is said to be reduced.

A four-post professional **drawing table** is announced by the **Kingsley Manufacturing Co.**, 748 East 82nd St., Cleveland, Ohio. Designed for use by draftsmen, engineers, architects, artists, and others requiring a large, substantial drawing surface, the table is made of sturdy hard maple with tops in a large range of sizes beginning at 36x60 in. A tracing drawer, 26x36x42 in. inside dia, is also available.

An improved type of MELT, **ice and snow-melting chemical pellets,** which are reputed to have 30 times the thawing capacity of salt, is announced by **The Chem Industrial Co.**, 1114 Hippodrome Building, Cleveland 14, Ohio. These small pellets are said to be 99% active chemically, and produce a great exothermic action. The manufacturer claims that the product's snow-melting ability is approximately ten times that of flake calcium chloride. Obtainable in 25-lb metal pails and 100-lb fiber drums.

A "Western-palette" of color-toned **penetrating wood sealers** designed to preserve wood grain and minimize warping and swelling is being introduced by the **Monsanto Chemical Company**, St. Louis 4, Mo. Color values of the sealers are complementary and may be used in any combination to achieve a smooth harmony. These sealers will be available through paint, lumber and hardware wholesalers in quarts, gallons and 5-gal cans.

Safety Flare plugs into the cigarette lighter of a car or pick-up truck and a strong electromagnet holds it securely to the metal surface of a car in any position while working on emergency repairs, flat tires, etc. It can also be used as a hand signal light for emergencies. Twelve feet of rubber cord are provided by the manufacturer, **A. G. Busch & Co., Inc.**, 2632 N. Central Ave., Chicago 39, Ill.

A new line of vibrators said to be air cushioned, preventing metal-to-metal pounding, has been announced by the **Cannon Vibrator Company**, 1111 Power Ave., Cleveland 14, Ohio. The air-cushioning principle eliminates bolt breakage, greatly reduces general maintenance and increases vibrator life.

Where paving meets one of its severest tests...

Boston Post Road

Above photographs show resilient, heavy-duty Texaco Asphaltic Concrete being laid on the Boston Post Road in the Village of Mamaroneck, N. Y. View of the completed pavement at the right. Contractors: Peckham Road Corporation, White Plains, N. Y. and Cold Mix, Inc., Port Chester, N. Y.

Boston Post Road in Old Greenwich, Conn. Also served by Texaco Asphaltic Concrete paving, which was laid in 1948.

Main truck route between New York City and Boston, the Boston Post Road is one of America's most important highways. The pavement constructed on this road must stand up under the heaviest kind of impact day after day, year in and year out.

Resilient, heavy-duty Texaco Asphaltic Concrete, whose rugged durability has been demonstrated on other sections of the Post Road, was used this year on a two mile section of the route in the village of Mamaroneck, N. Y.

Wherever heavy traffic must be served—principal city streets, trunk highways, bridges or vehicular tunnels—heavy-duty Texaco Asphaltic Concrete is a sound choice. Its past performance on the Boston Post Road, the Delaware River Bridge at Philadelphia and many sections of U. S. Route 1, for example, furnish convincing proof of its ability not only to stand up under punishing impact, but to do so at a relatively low annual cost.

Helpful information on Texaco Asphaltic Concrete, as well as other plant-mixed types of asphalt construction, is provided in a booklet entitled, "Texaco Asphalt Paving—Plant-mixed Types." Our nearest office will send you a copy without cost or obligation to you.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

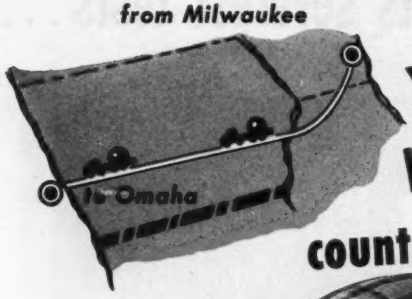
Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2 Richmond 19

TEXACO

TEXACO ASPHALT

The man* said:

"We need a special trailer to handle a tough cross-country hauling job . . ."



*LeROY L. WADE & SONS, INC.
Heavy Hauling Contractor
Omaha, Nebraska

the project:

Transporting 20-ton spheres, each 16 feet in diameter, 780 miles, from the Milwaukee Works of A. O. Smith Corporation to the Quaker Oats Plant in Omaha. The huge, spherical digesters were too large for railroad transportation and the time element would not permit barging—so a highway trucking plan was used.

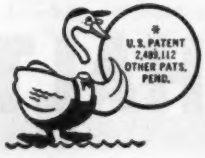
Loading the spheres at the Milwaukee Works of the A. O. Smith Corporation prior to the trip.

some of the problems:

- must travel 780 miles instead of 500-mile direct route because of low overheads and weak bridges.
- to design and build special trailer decks for excess widths.
- to maintain sufficient road speed to make the trip in four days.
- to arrange highway police escort for entire route.
- to assure perfect safety during the haul.

A special TALBERT TRAILER with removable gooseneck* and a removable tandem section was designed for this job in conjunction with LeRoy L. Wade & Sons, Inc. An extra wide deck (10'6") was used to accommodate the 16' diameter sphere.

When this project is completed, Wade can easily convert this unit to a standard type trailer by simply putting a standard type deck between the removable tandem section and the removable gooseneck.



THE TALBERT CONSTRUCTION EQUIPMENT CO., of Lyons, Illinois manufactures a complete line of low-bed trailers and dump semi-trailers

THE TALBERT-WAY IS THE EASY WAY

SNOWLOADER* SAVES MONEY

Cost of Unit Will Be Repaid By Year's End

(From The Norwalk Hour)

The Athey Force-Feed Loader, purchased by the city of Norwalk this year, may save enough city money to pay for itself before the year's end, Public Works Commissioner Paul J. James said today.

Statistics were produced to show that the efficient operation of the loader on snow removal tasks after last weekend's snowfall gave the city huge savings. Should there be additional snows this season further gains will be made.

Speed Cited For Lower Costs

(From The Norwalk Hour)

Reductions in time spent in clearing snow have brought down the cost of this operation. Commissioner James said, "With our two Athey Force-Feed Loaders we clear five to six times more snow than by previous methods."

"It used to take us 13 hours to clear snow, but now we do it in 4 with our Athey Loaders," reports Street Superintendent William Silk.

The streets and sidewalks of the business district are cleared completely before the 9:30 opening time each morning. Former methods of hand-shoveling, bulldozers, and power-shovels were a constant danger to street surfaces and users.

NORWALK BUYS 2nd SNOWLOADER*

(From The Norwalk Hour)

Members of the Board of Estimate and Taxation appropriated funds for the purchase of another Athey Force-Feed Loader at their meeting Wednesday night.

After hearing of the remarkable savings in time and labor that the first loader returned on snow removal tasks, the board agreed that the purchase of a second machine was good economy. Praise of the unit's operation was voiced by a delegation of local merchants who saw the Athey Loader at work saving their Christmas business.

SNOW REMOVAL TIME CUT BY TWO-THIRDS WITH NEW LOADER

(From The Norwalk Hour)

The heavy snowfall that hit Norwalk, Conn., last Sunday night, was cleared in just 4 hours with the city's new Athey Force-Feed Loader. According to Street Superintendent William Silk, this speedy removal represents the saving of some 9 hours of work. The machine is shown biting into high-piled snow.

MERCHANTS PRAISE CITY DEPARTMENT

In a letter to Commissioner of Public Works Paul James, the Retail Merchants Division of the Norwalk Chamber of Commerce extended their gratitude to the Commissioner and his workers for the excellent snow removal work done last week.

Sherwood Prothero, Executive Secretary for the Chamber, wrote, "Your efforts saved the Christmas business. The snowfall meant severe losses, until your department with its new Athey loader cleared the streets and saved the day."

The use of the Force-Feed Loader meant the difference between profit and loss!

EDITORIAL

(From The Norwalk Hour)

Norwalk's taxpayers got a chance last week to see its new snowloader* in action—and were amazed. The loader gathered snow at a great rate of speed and dropped it into waiting trucks which carted it away. There was no delay or loss of time and the business areas were cleared quickly and efficiently, and certainly at a lower cost.

This one demonstration proved the worth of the Athey Force-Feed Loader. It also clearly showed that the city would be practicing false economy if it didn't buy a second loader this year.

*Athey Force-Feed Loader.

*Athey Force-Feed Loader.

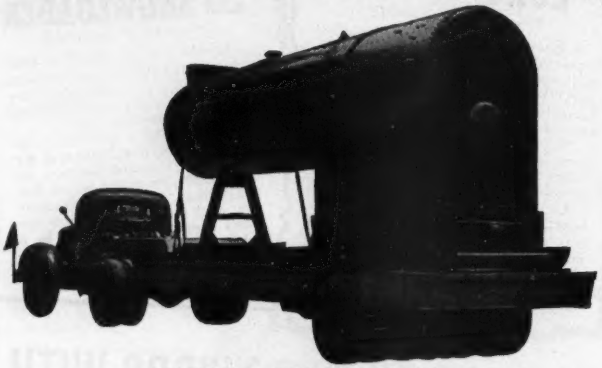
FORCE-FEED Athey LOADERS

FOR DETAILED INFORMATION:

Athey PRODUCTS CORPORATION

5621 WEST 65th STREET • CHICAGO 38, ILLINOIS

NEED STEAM?



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Skid mounted with 24" oil burning base.

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1. 1040 sq. ft. heating surface.
2. 160 cu. ft. furnace volume.
3. Ample steam volume 54 cubic feet.
4. Oversize seamless firebox.
5. Butt straps calked and seal welded inside.
6. Four-inch water space around firebox.
7. Boilers available from 40 to 150 H.P. Working Pressures from 125 to 350 lbs.

Write for descriptive literature.

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SMOKE STACKS • BREECHINGS • FLY ASH REMOVAL UNITS
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For KNOW-HOW ENGINEERING SUPERVISION EQUIPMENT to keep jobs DRY

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

JOHN W. STANG CORPORATION

2 Broadway, New York 4, N. Y. — 2123 S. 56th St., Omaha, Nebr. — 8221 Atlantic Ave., P.O. Box 631, Bell, Cal.

New **full-wall panels** which are thoroughly waterproofed throughout have been developed and introduced by the **Upson Company** of Lockport, N. Y. Known as Upson Strong-Bilt waterproofed panels, they are the largest on the market, measuring 8x18 ft. Tests conducted by the Pittsburgh Testing Laboratory proved the new panels do not absorb more than 13.5% by weight when entirely submerged in water for 24 hr.

A **complete muffler group** for the new diesel DW20 and DW21 tractors is offered by **Caterpillar Tractor Co.**, Peoria 8, Ill. The new attachment will reduce engine exhaust noise, providing greater operator comfort and reducing annoyance for people living near job sites.

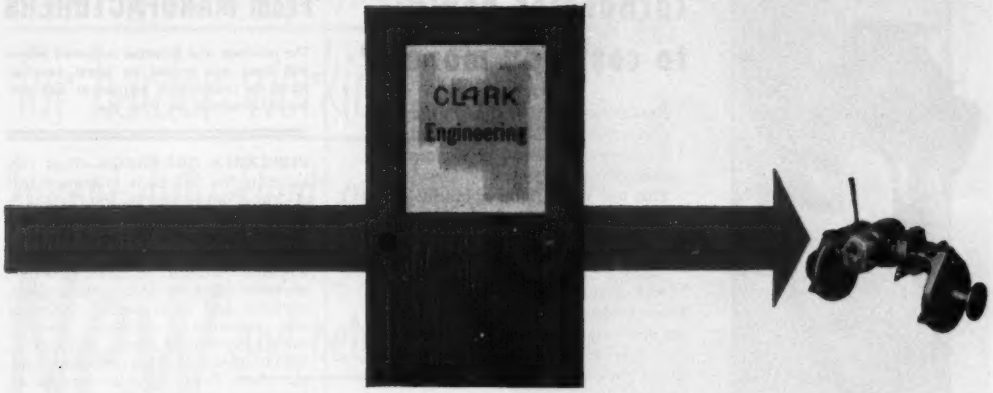
A new type of **hand cleaner** called "Skin-Cote" is announced by the **Boyer-Campbell Company**, 6540 St. Antoine St., Detroit 2, Mich. When rubbed on the skin, it turns to a liquid and precludes the use of solvents and thinners which may be harmful to the skin, as well as inflammable. It has been used successfully to remove such materials as gasket sealing compounds, rubber cements, paints and resins.

Safety-Flag is an aid for all automobiles and trucks for daytime warnings during emergencies. Manufactured by **A. G. Busch & Co., Inc.**, 2632 N. Central Ave., Chicago 39, Ill., the Safety-Flag kit consists of two red flags with wooden handles and two pointed steel spears tapered for staking in the ground or in cracks along a highway.

An **underlayment and floor leveler** called Plastic Mix, is designed to bond tightly to metal, as well as other materials. Developed by **Pioneer Latex & Chemical Co., Inc.**, Lincoln Boulevard, Middlesex, N. J., it is intended to provide a cushioned level surface for laying decorative flooring and is said to be easily applied and to set dry in 2 hr.

Snow-Rem is a new **liquid snow plow wax** for fast spray gun application on snow plow wings and moldboards. Manufactured by **Speco, Inc.**, 7308 Associate Ave., Cleveland, Ohio, this is a companion product to the standard Snow-Rem which is applied by hand with a paint brush.

A new **aluminum paint** has been developed for withstanding extreme heat as high as 1,200 deg F. Known as HI-TEMP, it is said to insure lasting protection against peeling, discoloring, blistering and all other problems caused by extreme heat. Manufactured by the **Illinois Bronze Powder Co.**, 2023 So. Clark St., Chicago, Ill., it is said to need no special surface preparation, as one coat covers by brush or spray and it dries in 1 to 2 hr.



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B-W

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New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

PORTABLE CRUSHERS—This 12-p bulletin No. 265 E, is crammed full of information about the Telsmith line of crushers, feeders, loaders, and related equipment. Included are portable types (on steel or rubber wheels), "Junior" crusher-screener, portable crushing and loading plant, portable and semi-portable primary and secondary crushers, feeders, washing-screening setups, and finally, the complete crushing-screening-loading plant. Concise tables contain information on jaws, gyratories and rolls.—**Smith Engineering Works, Milwaukee 12, Wis.**

PAYLOADERS—The Hough Company has just published a comprehensive 12-p catalog entitled "Profitable Construction With Payloaders." It's slanted for contractors, public works departments, utilities, mines and pits, and contains many on-the-job photos showing earthmoving, materials handling, lifting and carrying jobs. Payloader accessories are shown, as well as job data and machine specifications. It's catalog No. 217.—**The Frank G. Hough Co., 706 Seventh St., Libertyville, Ill.**

ELECTRIC BRAKES AND CLUTCHES—These are the subjects of a complete new handbook which contains information on their design and application for industrial use. It incorporates unit sizes, mounting dimensions and engineering performance specifications. The handbook is No. 701-A.—**Warner Electric Brake & Clutch Co., Beloit, Wis.**

VENTILATORS AND LOUVERS—A condensed catalog supplies design and construction features for each ventilator type, plus mounting and flashing details; performance, dimension and weight data. Basic information on dampers, bases, industrial louvers and general purpose louvers also is included.—**The Burt Manufacturing Co., Dept. EN, 927 S. High St., Akron 11, Ohio.**

INSULATED DOORS—This is a 12-p data and specification booklet to guide architects, contractors and builders in selection of proper types of cold storage doors for various temperature conditions. Basic types are shown: reach-in, walk-in, track and vestibule models. An additional helpful feature is a check list of items to remember when selecting and/or specifying such a cold-storage door.—**Jamison Cold Storage Door Co., Hagerstown, Md.**

Now, greater protection for harder working heavy-duty fleet engines

New and better...

STANOLUBE HD-M

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Motor Oil

For nine years, STANOLUBE HD Motor Oil has demonstrated its ability to cope successfully with the most difficult problems of lubrication in automotive diesel and heavy-duty gasoline engines. Now, all of the outstanding qualities of this product have been incorporated in a new and better heavy-duty lubricant: STANOLUBE HD-M Motor Oil.

In extensive field tests, new STANOLUBE HD-M has proved its ability to benefit harder working heavy-duty fleet engines these two ways:

1. Extends engine life. Because of improved detergent-dispersant action, new STANOLUBE HD-M keeps engines clean under severe conditions imposed by adverse fuel quality, higher operating temperatures, and prolonged periods of hard operation. Freedom from harmful deposits means less wear, longer life for fleet engines.

2. Reduces maintenance. Because it has greater oxidation stability, new STANOLUBE HD-M helps keep pistons, rings and valve stems free from varnish-like deposits caused by oil oxidation and provides protective films of oil in the face of high operating temperatures. Less wear of engine parts, longer periods between overhauls mean less overall maintenance.

A Standard Oil lubrication specialist can help you obtain maximum lubrication benefits from STANOLUBE HD-M. To reach him, just phone your local Standard Oil Company (Indiana) office.

Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

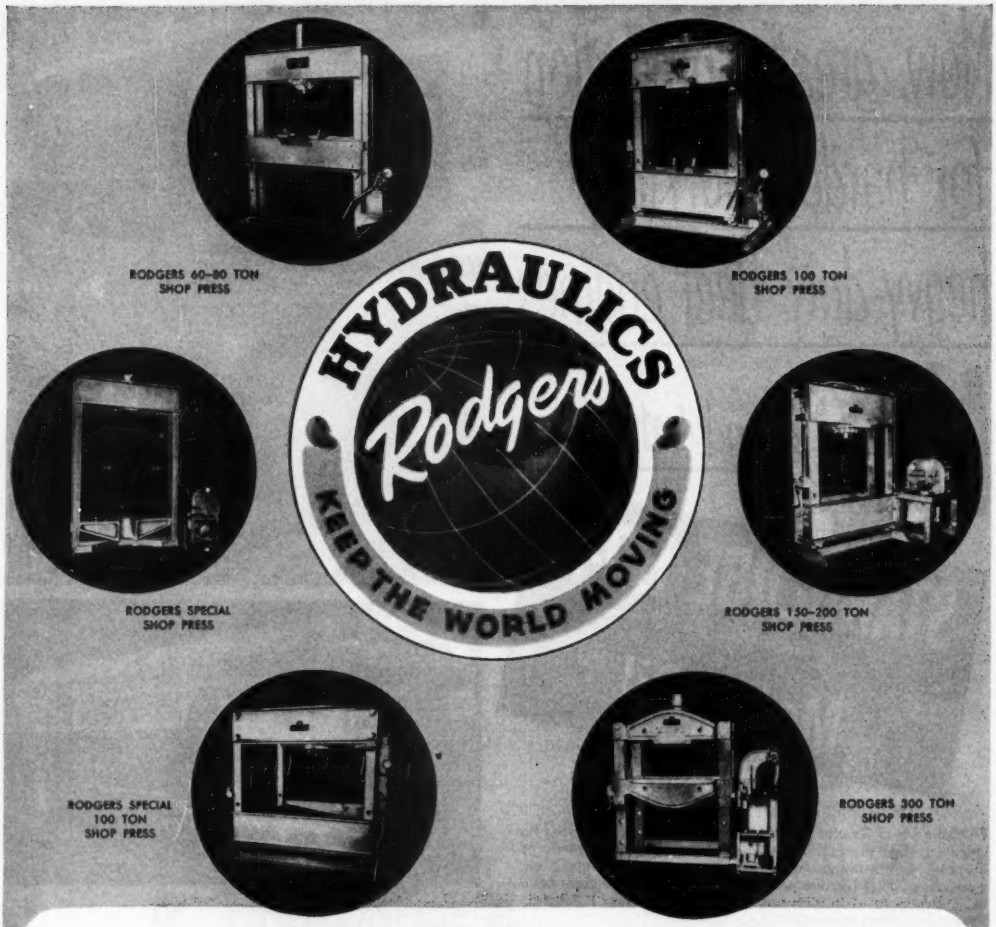
A Complete Line of Motor Oils for Every Heavy-Duty Service Need

STANOLUBE HD-M is recommended for all internal combustion engines. It meets U. S. Army specification MIL-0-2104. This lubricant provides excellent cleanliness, low wear rate, and low oil consumption under severe operating conditions. Available in all SAE grades.

STANOLUBE S-1 is recommended for use in automotive, diesel, or gasoline engines where other heavy-duty oils cannot control deposits caused by operational severity or adverse fuel quality. It meets requirements of MIL-0-2104 and the requirements for "series 1" type oils as well. Available in all SAE grades.

STANOLUBE HLA is recommended for use in supercharged diesel engines and in other engines that operate under the most adverse conditions. It meets the requirements of MIL-0-2104 and the requirements of "series 2" type oils. Available in SAE 10 and SAE 30 grades.

STANDARD OIL COMPANY (INDIANA) STANDARD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RODGERS 60–80 TON SHOP PRESS
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Rodgers Catalog No. 313A has descriptions and specifications on the complete line of Shop Presses.

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Heat-YES! Fumes-NO!

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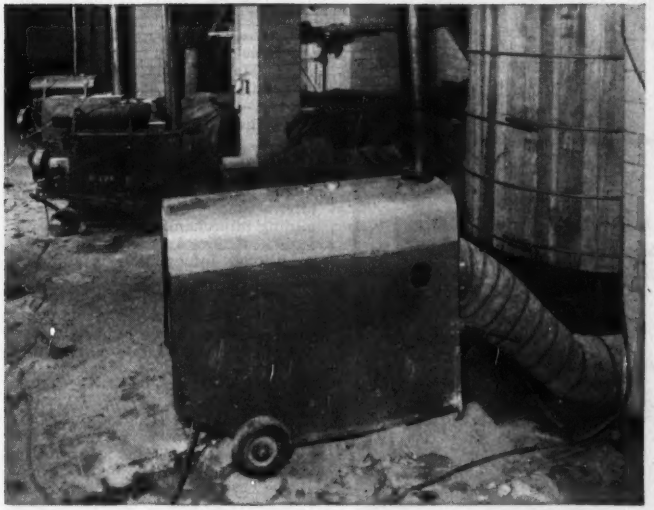

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Electric motor powered
Uses kerosene for heating fuel
280-450,000 BTU capacity
Automatic temperature control

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Electric motor powered
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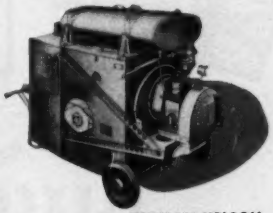

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Uses gasoline for heating fuel
250-385,000 BTU capacity
Completely self-contained

WHEN you count the cost of unsafe heating methods on construction jobs you'll make one choice. Only Herman Nelson offers "sealed flame" protection from insidious carbon monoxide. You can keep construction going ahead right through frigid winter months when you operate portable heaters. But you can't get top production from expensive skilled workmen who are partially "knocked out" by hazardous fumes.

Make certain you have all-winter, all-weather protection on your jobs. Plan to own and operate Herman Nelson Portable Heaters. *For the best deal, deal now.* See your nearest Herman Nelson distributor, or write Dept. CM-11.

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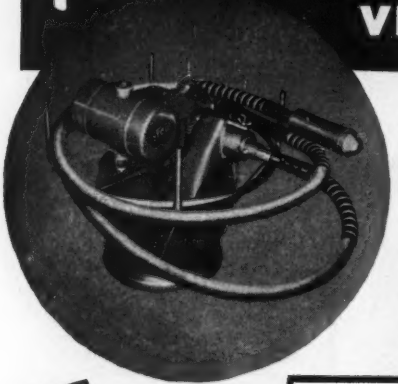

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- Strong, durable . . . pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4699 Lexington St., Chicago 44, Ill.

THREADED BARS—A new bulletin entitled "Ryerson Threaded Bar Service" gives data on size range, length, kind of thread, bending, and types and finishes of steel bars that are furnished threaded. The bulletin also illustrates some of the accessories that are furnished, including turnbuckles, nuts, washers and tank lugs.—**Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill.**

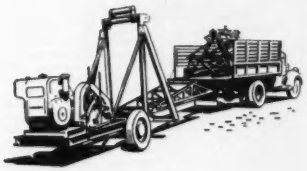
ELECTRICAL ENGINE EQUIPMENT — "At Your Service — Leece-Neville" is the title of a 24-p brochure published by this manufacturer of electrical equipment for diesel, gas, and gasoline engines. Pictorial sections show the company's production, assembly, testing and engineering facilities, developed over a period of 40 yr. The balance of the booklet shows typical equipment made for buses, trucks, industrial engines, off-highway equipment, passenger cars, rail, marine and aircraft. Included are ac-dc alternator systems, generators, starting motors, hand and magnetic switches and voltage regulators. — **The Leece-Neville Co., Cleveland 14, Ohio.**

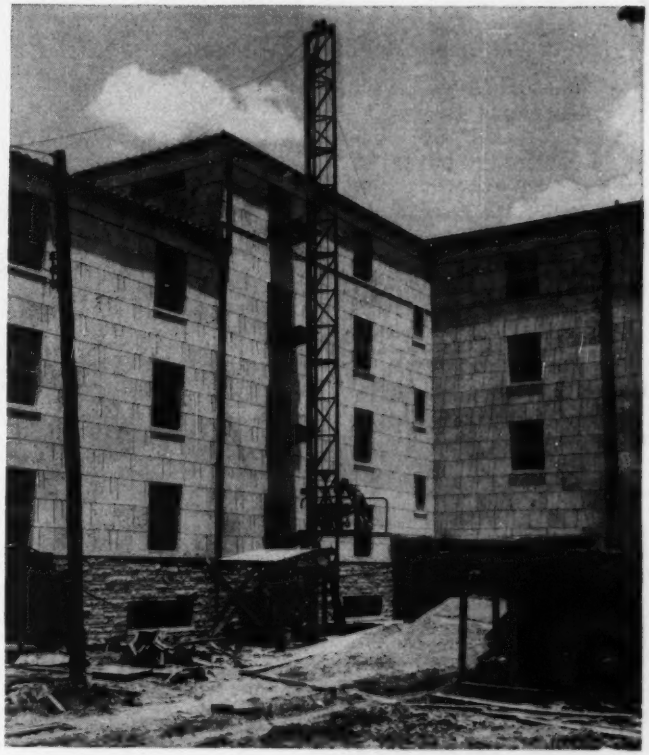
CHAIN DRIVE CATALOG—A new catalog, HD-51, assists in chain drive selection. It has been compiled to offer a simple, quick means of determining interchangeability of various makes of roller and conveyor chains. Additional information is supplied which is of value in determining the proper application of chain drives as a power transmission or conveying medium.—**The Whitney Chain Co., 237 Hamilton St., Hartford 2, Conn.**

NEW REAR-DUMP TRUCKS—These are described in a 16-p catalog in two colors containing specifications of the engines, transmissions, drive axle, frame and body. Listed as Form No. 121, it illustrates Model 45TD and Model 46TD. Each has a 10-speed transmission and is available with standard or quarry body. A heated body which speeds the dumping operation during cold weather is available as optional equipment. — **The Euclid Road Machinery Co., Cleveland 17, Ohio.**

PLASTIC ROCK FLOORING—Publication of a completely new 8-p brochure on plastic rock flooring is announced by United Laboratories, Inc. The booklet contains information on how and where to apply Plastic Rock Flooring over wood, steel or concrete. Certain technical data are included about the product itself. Many typical flooring applications are illustrated in the brochure showing the product applied on railroad platforms, service floors, trucking aisles, stair treads, loading platforms, roofs and ramps. Highlighted in the literature is use of this flooring for resurfacing traffic areas for protection against heavy foot and wheel traffic. — **United Laboratories, Inc., Cleveland 12, Ohio.**

One truck moves it





THERE are three ways to move an American Portable Material Elevator. You can dismantle it and *carry* it on one truck. You can take the tower apart and *tow* the base, on rubber-tired transport wheels. Or you can leave the tower up, and *skid* the complete elevator from spot to spot on the job. All you ever need is one truck.

Pin connections—not bolts—fasten the tower to the base, and the platform to the tower carriage. This makes quick work of dismantling, or of change-over from platform to self-dumping ½ yard concrete bucket.

The American PME stands 47′ without guying; up to 97′, guyed, by adding 10′ sections. Capacity 2500 lbs. Lifting speed 90′ a minute. Talk to your American Hoist distributor about renting or buying.

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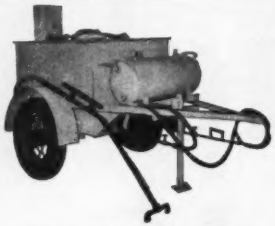

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For Industrial Tractors
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Portable — Stationary
Write for Circulars

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BLADES *For Snow and Ice Removal*

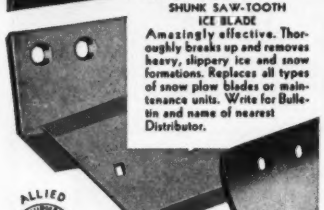
FOR ALL MAKES AND MODELS OF SNOW PLOWS

Made of specially developed steel to withstand severe service conditions.

Various widths, lengths, thicknesses—flat or curved—standard or special—punched ready to fit your machine.

SHUNK SAW-TOOTH ICE BLADE

Amazingly effective. Thoroughly breaks up and removes heavy, slippery ice and snow formations. Replaces all types of snow plow blades or maintenance units. Write for Bulletin and name of nearest Distributor.



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MANUFACTURING COMPANY
ESTABLISHED 1854
BUCYRUS, OHIO

COPPER AND COPPER ALLOYS—This booklet is the result of years and years of continuous laboratory research and field study of the nature of corrosive attack on copper and copper alloys. The 24-p booklet, first of its type in the industry, explains the chemical and physical nature of corrosive attack in its various forms. Included is a tabulation indicating the relative corrosion resistance of the principal types of copper and copper base alloys when in contact with 183 different corroding agents. This booklet, Anaconda Publication B-36, is available from—**The American Brass Co., Waterbury 20, Conn.**

STABILIZATION OF GRAVEL ROADS—Who can be sued for an automobile accident caused by loose gravel? This and other subjects concerning unstabilized gravel roads are discussed in an 8-p bulletin which treats the cost of stabilization vs the savings possible in lower maintenance and in the elimination of gravel losses. An interesting feature of the bulletin shows a method by which $150 to $500 of gravel per mile can be salvaged from shoulders and ditches where it has been chipped by traffic.—**Seaman Motors, Inc., 305 N. 25th St., Milwaukee, Wis.**

PACKAGED ELECTRIC POWER — A 24-p bulletin on packaged electric power for industry's third (and biggest) expansion is now available from General Electric Co. Designated as Bulletin GEA-5600, the publication outlines methods of obtaining electric power equipment for quick expansion at low cost and with a minimum of critical materals. Use of "packaged" electrical systems simplifies plant engineering problems, cuts equipment and installation costs, conserves vital materials and manpower, and insures quicker delivery of electrical equipment, according to this bulletin. The "package" units, comprised of standardized components, eliminate the need for individually engineered assembly of piecemeal components. Each package is a complete, factory-assembled unit designed for a specific job and ready for operation the moment it is delivered.—**General Electric Co., Schenectady 5, N. Y.**

HOSE FITTINGS AND LINE OILERS—A bulletin and a specification sheet—the first in a series to supersede the Blue Brute Accessories Catalog—have been announced by Worthington Pump & Machinery Corp. The bulletin covers Blue Brute hose fittings, including sizes, parts numbers and applications. Included are hose nipples, union nuts, hose clamps, coupling spuds, reducing coupling spuds, hose valves and splicing nipples. The specification sheet (H-1200-B45) pictures and describes the new 2-qt oil liner, giving detailed specifications.—**Worthington Pump & Machinery Corp., Dunellen, N. J.**

SOIL MECHANICS, FOUNDATIONS, AND EARTH STRUCTURES

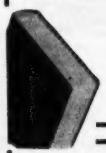
Just Out

1. **Covers the theory of soil mechanics,** together with the principles and practices of designing and constructing foundations and earth structures indicating the important relationship of these 3 subjects. Emphasizes experimental data and field observation, giving numerous examples of both successful and unsuccessful structures. Covers the estimation of the shearing strength of soils, lateral earth pressures, the effects of plastic flow, sensitivity of various clays to remolding, etc. **By Gregory P. Tschebotarioff, Prof. of Civ. Eng'r'g., Princeton Univ. 655 pages, over 400 illus., $6.50**

PILE FOUNDATIONS

Just Out

2. **Theory—Design—Practice.** Provides the information required for the design, driving, and maintenance of pile foundations. Covers the relations between borings and soil mechanics and pile foundations; most effective methods of determining pile capacities from driving resistances and friction values; selection of driving rigs; factors affecting choice of pile types, etc. Gives over fifty actual cases of pile foundation failures, with causes and remedies. **By Robert D. Chellis, Structural Engr., Stone & Webster Corp. 640 pages, 6 x 9, 225 illus., over 100 tables. $12.50**



LEGAL PHASES OF CONSTRUCTION CONTRACTS

3. **Discusses 46 different legal problems that arise in construction contracts,** showing engineers, architects, contractors, and attorneys the attitude courts have taken toward their problems. Provides cases which are **typical** of all important legal problems involving construction contracts — giving you a compact manual that can help you avoid the **legal pitfalls** in your work. Shows actual language of contract provisions . . . quotations from courts' decisions . . . material facts on each case, etc. **By Vernon Werbin, Member, New York Bar. 267 pages, $3.50**

HOUSE CONSTRUCTION COSTS

4. **Shows you how to determine unit costs of house construction**—applying to all designs and to local price variations. Tells how to determine costs for every building operation; includes data on quantity of material and number of labor hours needed; gives examples of typical unit costs. **By G. Underwood. 302 pages, 63 illus., $4.75**

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5 Men Erected and Braced 4500 sq. ft. in 20 hrs.

Walls Checked within ¼" of True Round

Part of Tucson Sewage Treatment Plant M. M. Sundt Construction Co., Contractors

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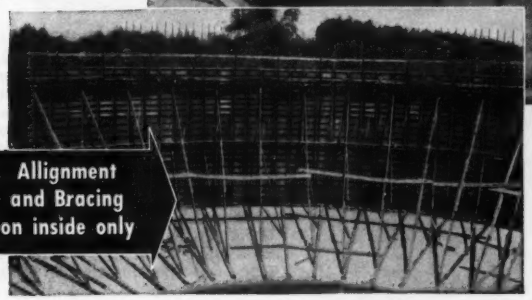

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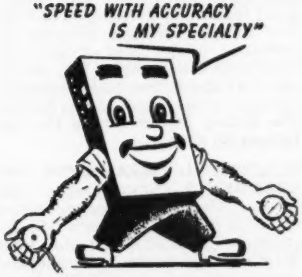
Only UNI-FORMS Provide 3-Way Savings . . . Time . . . Labor . . . Materials



THE JOB: Form and pour two 80′ digester tanks. Walls vary from 15 to 21 inches, are 32 feet high. Tolerance ½". Forms must check within ¼" of true round. Concrete to be of high density, watertight consistency with a smooth face.

THE PROBLEM: Maintain required tolerances. Form and hold two pours—18 and 14 ft. high. Obtain maximum speed and economy in entire forming and pouring operation.

THE RESULT: UNI-FORMS were used to form the job. In spite of the high lift and accuracy required, aligment and bracing was necessary on 1 side only. Accuracy was maintained throughout. Erection of panels was fast—5 men erected 4500 sq. ft. of first lift in 20 hours. Finished concrete surface met specifications for smoothness. Contractor expects to finish job several months ahead of schedule. Congratulations to M. M. SUNDT CONSTRUCTION CO. for a job well done.

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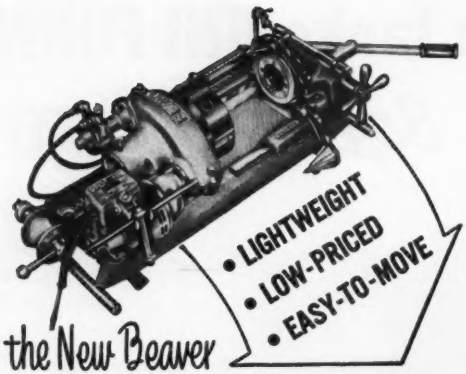

the New Beaver
Model-E Pipe and Bolt Machine

The new low-priced, lightweight Beaver Model "E" is a "junior edition" of the heavy-duty Beaver Model A—which has, for the past 20 years, been the recognized leader in the field of portable pipe and bolt machines.

Although designed primarily for hardware stores and small piping contractors and industrialists, BIG contractors will find the new Model "E" useful on jobs requiring extreme portability.

A pipe machine is no better than the service back of it and our 50 years of experience in this field, and our reputation for high quality and friendly service, is your best guarantee of complete satisfaction.

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- Picks itself up • Easily extends
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Optional Equipment: Gin Pole Assembly, "Chicago" Boom, Tip-Over Bucket, Truck Mounting, Interchangeable 10' Extensions.

CONSTRUCTION MACHINERY COMPANIES
WATERLOO, IOWA

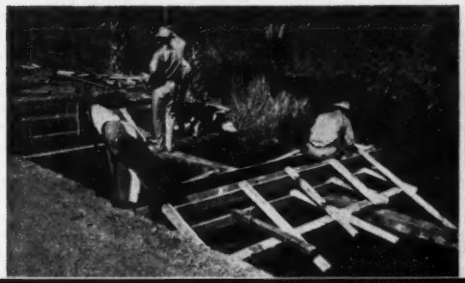
DREDGES — After a brief history about the company, this 49-p spiral-bound book explains different types of dredges: grapple, ladder, self-propelled hopper, plain suction and cutterhead pipeline. Every page has several pictures describing the use of various types for real estate development, land filling, sediment removal, channel maintenance and improvement, canal digging, dam and airport fill. A chapter at the end includes information on how to determine the proper equipment for any job and the four-day erection-assembly method for the portable rigs described. Catalog 825.—**Ellicott Machine Corp., Baltimore 30, Md.**

MASTIC FLOORING UNDERLAYMENTS—The composition and mixtures for asphalt emulsion and rubber latex binders are described, together with recommended practice in application in this 4-p folder. Flooring underlayments are used to provide a smooth, level base, resistance to shock, effective sound deadening and moisture resistance for installations of decorative floor covering.—**The Flintkote Co. Inc., 30 Rockefeller Plaza, New York 20, N. Y.**

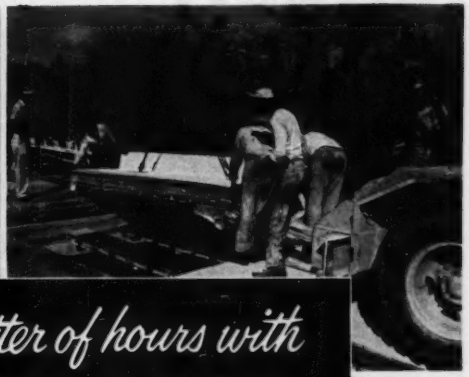
FEEDERS AND CONVEYORS—Capacities from a few ounces to 2,000 tons per hr; sizes from one micron to 4-ft cubes; densities from 4 lb to 400 lb per cu ft—these are some of the capacities and characteristics of Jeffrey-Traylor electric vibrating feeders and conveyors. Most important feature, however, is the company's claim to instantaneous and absolute control over the flow of material. Its 84-p booklet is crammed with information on power unit, controls, and specifications on each of dozens of types. Typical application of grizzly feeders, spreader feeders, dust-tight, sparkproof and waterproof feeders fill the booklet, and the rear section contains valuable information in the form of tables to determine valley angles, etc. All in all, it's about the most complete booklet of its kind we've seen.—**The Jeffrey Manufacturing Co., Columbus 16, Ohio.**

ELECTRICAL MEASURING INSTRUMENTS—Information on how to select electrical measuring instruments is provided in a new 30-p instrument booklet available from Westinghouse. Seven basic selection factors are explained. Different types of instruments available in each major classification are listed on a full-page check chart. Four typical selection problems are solved to help the reader make his personal selections. Complete lines of portable, switchboard, panel, recording, and socket instruments are described and illustrated along with the functions of each. For a copy of Booklet B-4696, write to—**Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.**

After removing timber deck and stringers, forms are set for the risers.

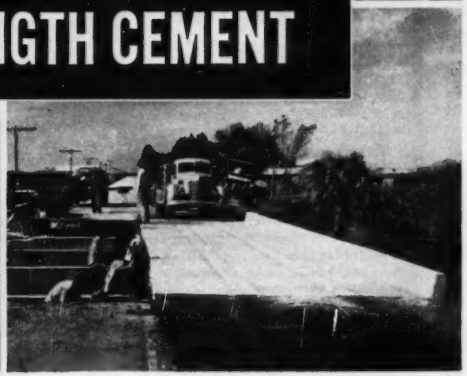


Placing concrete deck slabs.



Bridges rebuilt in a matter of hours with
LEHIGH EARLY STRENGTH CEMENT

Reinforcing bars projecting from slabs are joined with cable clamps. Forms are drawn up and wired under the open strips ready for pouring.



Traffic moving over completed half of a 5-span bridge.

Along the Tamiami Trail, Florida engineers are setting new records in rebuilding old timber bridges with fireproof and rotproof concrete. They are replacing worn-out decks in as little as 84 hours, at costs less than for timber construction.

With their unique design and construction methods . . . and Lehigh Early Strength Cement . . . a 2-span, 30-foot bridge, for instance, is rebuilt in 4 working days; a 5-span bridge in 9 days.

Deck slabs are precast in the district maintenance yard. Forms are stripped the following day. Slabs are immediately moved to storage, or in emergencies, to bridge site. And here's the schedule for replacing a typical 2-span bridge.

FIRST DAY. The crew barricades one half of roadway, rips off one half of deck and stringers, sets forms and pours concrete risers on existing piers. Other half of roadway is open to traffic.

SECOND DAY. The crew places slabs ten inches apart on piers. Forms are drawn up and concrete poured in the open strips by 2 P.M. and approaches completed.

THIRD DAY. The finished half of bridge is ready for traffic. Construction of other half follows same method. By end of fourth day, the entire bridge is completed.

Engineer of Bridges:
W. E. DEAN

District Engineer:
J. M. WATSON

Ass't District Engineer:
WINSTON CARLTON

Maintenance Engineer:
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With application controls at the rear
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Automatic and constantly maintained application of pressure
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Accurate, non-clogging, no-streak application guaranteed

Rosco has developed these features, many of which are now universally used. Buy Rosco and be assured of the latest design advantages.

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ROSCO MANUFACTURING CO.
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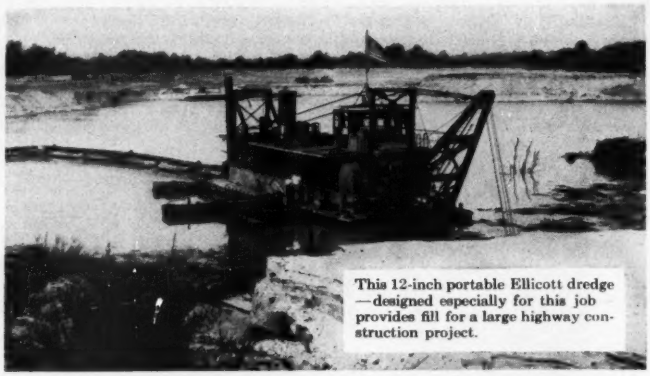
ROSCO MAINTENANCE UNIT
For repair and secondary construction. Both truck and trailer mounted units are available.

SAFETY RELEASE VALVES—This is a bulletin with charts showing the capacity required from safety valves to give 100% protection in case of pressure reducing valve failure. Also shown is a gas volume-weight chart for determining volumes per lb of gases with various specific gravities at different pressures and temperatures. Many of the company's models of valves are illustrated, together with a number of tables giving valve capacities in steam, air, and .6 sp gr gas at various pressures. All engineering data are approved by the ASME Standard and National Board. Relief valves shown and described are for the protection of boilers, compressors, heat exchangers, kettles, pressure piping, pressure vessels, process equipment, and regulators. Ask for Bulletin No. 851.—**Marine and Industrial Products Co., 3731-35 Filbert St., Philadelphia 4, Pa.**

VITRIFIED CLAY LINER PLATES—This 6-p folder on liner plates includes installation procedures, drawings and tables. Recommended procedures are included for lining precast concrete or monolithic sewers where it is desirable to use a sulphur or an asphalt joint. Repair work and re-lining of existing sewers are included. — **Universal Sewer Pipe Corp., 1500 Union Commerce Bldg., Cleveland 14, Ohio**



This 12-inch portable Ellicott dredge —designed especially for this job provides fill for a large highway construction project.

Reduce Excavation Costs with Ellicott Dredges!

LOW *initial* **COST!** Ellicott engineering and development are geared to *continual* production of dredges and dredging equipment. Thus, costs *per dredge* are kept to a minimum.

LOW *operating* **COST!** Ellicott dredges deliver solids at the lowest cost per yard. Sound engineering and design —based on over 65 years' experience— assure maximum efficiency.

LOW *maintenance* **COST!** Ellicott design gives longer life to the wearing parts. Ease of replacement and availability of parts minimize costly down-time, as many Ellicott customers testify.

ELLICOTT designs, builds, delivers and services any dredge from 8 inches to 36 inches in size—under a single contract. Ellicott's 65 years of experience is your guarantee of performance. WRITE TODAY for our General Catalog No. 825 or Bulletin No. 804, describing the versatile 8-inch Little Dragon® portable dredge.
ELLICOTT MACHINE CORPORATION, 1605 Bush St., Baltimore 30, Md.

ELLICOTT DREDGES

ROAD MACHINERY PRODUCTS — A 6-p folder issued by the Bros Co., gives complete information and specifications on medium weight tampers, giant weight tampers, portable steam boilers, asphalt circulators and heaters, and pneumatic tire rollers, and the huge Roll-O-Pactor. Drawings explain the individual-drum oscillation available on the giant weight tamper. These include single and double end oscillation, as well as center and offset oscillation. The huge Roll-O-Pactor is illustrated by on-the-job photos taken on the New Jersey Turnpike. The machine has rolling capacities from approximately 12 tons empty to 50 tons fully loaded.—**Wm. Bros Boiler & Manufacturing Co., Minneapolis 14, Minn.**

WALL FORMS—Here is a revised and enlarged 40-p booklet illustrating types of concrete structures on which Atlas All-Steel forms were used. It contains line drawings and complete directions for the erection and dismantling of these forms. It also includes a data sheet for the submission of rough sketches for further information and quotations on cost of rental and purchase of the Atlas Steel Forms.—**Irvington Form and Tank Corp., 20 Vesey St., New York 7, N.Y.**

RUST PREVENTIVES — "Worried About Rust?" is the title of a 4-p folder telling how OSCHO, a metal primer applied directly over rusted surfaces, stops rust and primes metal for paint. Advantages, prices, containers, and other interesting information are all covered in this illustrated folder. — **Rusticide Products Co., 3125 Perkins Ave., Cleveland 14, Ohio.**

HEAVY-DUTY TRUCKS—An illustrated bulletin is available showing the Federal line of heavy-duty motor trucks, including six-wheelers. It also has sections covering Federal gasoline and diesel engines, special heavy-duty construction features and specifications on the complete line.—**Federal Motor Truck Co., Detroit 9, Mich.**

WOOD PRESERVATIVES — A new member of the fungus-ban family is announced by the Wilbur & Williams Co. This is a copper naphthanate dip for wood to be exposed to immersion in water. The product imparts a green color to the wood, indicating that it has been treated, and gives primary protection against dry rot. The booklet explains that the preservative treatment can be painted over with ship paint or normal paint after 24 hr drying as it is of a non-crystallizing nature. Made to meet federal specifications, the product supplements others made by the company, including products for dimensional control, toxic control for wood preservation, and others.—**The Wilbur & Williams Co., 130 Lincoln St., Brighton, Boston 35, Mass.**

Most leading makers of heavy-duty earth moving equipment specify Johns-Manville Industrial Friction Materials

Here are good points to remember when it comes time to replace clutch and brake friction materials on your machines . . .

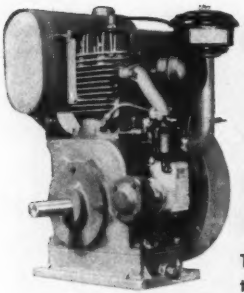
By far the majority of earth-moving machine manufacturers choose Johns-Manville Industrial Friction Materials. That's not surprising, actually J-M Friction Products have set records for long service and low-cost operation. They are *engineered* for the job—specially formulated for trouble-free performance and maximum working life.

And Johns-Manville's rigid manufacturing and inspection controls provide real insurance of uniformly high quality.

If you want to be sure that your own equipment will continue to give the excellent service built into it—take a tip from the machine maker. Replace only with genuine Johns-Manville Friction Materials.

Write for your copy of *"Johns-Manville Industrial Friction Materials"* FM-12A. It contains a wealth of important application and performance data. Address: Johns-Manville, Box 290, New York 16, New York.

Johns-Manville
INDUSTRIAL FRICTION MATERIALS
No. 1 With Leading Manufacturers



Four Single-Cylinder WISCONSIN *Air-Cooled* ENGINES Offering More POWER ADVANTAGE, 6 to 9 hp.

This series of single-cylinder models have all of the traditional Wisconsin heavy-duty features such as self-cleaning tapered roller bearings at both ends of the crankshaft, rotary-type, high tension OUTSIDE magneto operating as an independent unit, and maximum torque at all usable speeds.

CONDENSED SPECIFICATIONS

MODELS	AEH	AFH	AGH	AHH
Bore - - - - - - - - - inches	3	3¼	3½	3⅝
Stroke - - - - - - - - - inches	3¼	4	4	4
Disp. cubic inches - - - - - - - - -	23	33.2	38.5	41.3
H. P. and R.P.M. range - - - - - - -	3.9 at 1600	6.0 at 1600	7.2 at 1600	7.7 at 1600
	6.1 at 2600	7.2 at 2200	8.4 at 2200	9.2 at 2200
Net weight in lbs., Standard Engine - - -	130	180	180	180

Our engineering department will gladly cooperate with you in adapting Wisconsin Engines to your requirements. Write for detailed data and name of the nearest Wisconsin distributor.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46 WISCONSIN

for low-cost, record-breaking performance

it's the McCARTHY SELF-PROPELLED HORIZONTAL DRILL

● The self-propelled McCarthy makes blast holes close to the floor or bottom and it makes them fast!

Actual records show that for operations in shale, sandrock and soft limestone overburdens, these tough, mobile power units easily drill up to 1500 feet per day.

Operators like the compact McCarthy design . . . ideal for working confined areas. They like the four special, individual leveling jacks that make setups easier, and the smooth, steady way the hydraulic carriage moves forward, feeding 4, 6 and 8-inch diameter auger sections into the earth to depths of 100 feet or more.

Write today for the complete story on McCarthy Drills. There's bigger money waiting for you and McCarthy knows how you can get it faster. List of users on request.

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THE SALEM TOOL CO.

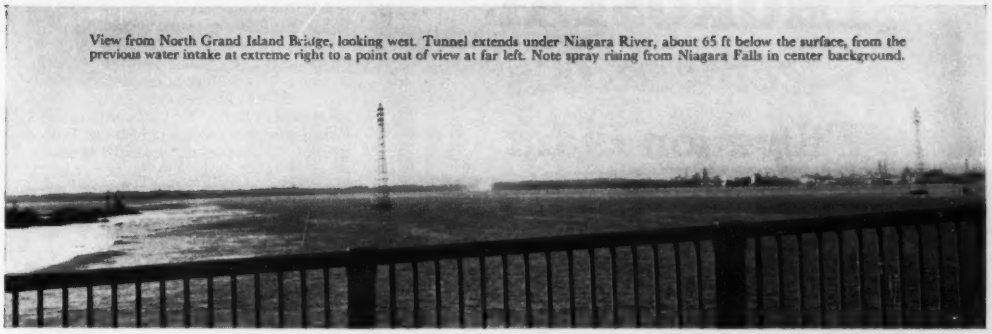
765 S. Ellsworth Ave., Salem, Ohio

WATER HAMMER—The cause, effect and control of water hammer in piping systems are considered in an 8-p bulletin, well illustrated and easy to read. After describing water hammer in non-technical terms, the brochure indicates its potential damage to piping, instruments and other parts of water systems, and then considers methods of controlling it. Shown in the brochure are a number of curves representing some of the hundreds of tests taken. The curves indicate pressures up to 304 psi, developed in only 1/10 sec, and illustrate the bellows-like expansion and contraction of a pipe subjected to water hammer. Bulletin No. WH-851 may be obtained from—**The Williams Gauge Co., 1620 Pennsylvania Ave., Pittsburgh 33, Pa.**

INSULUX GLASS BLOCK—The important role of glass block, especially as a replacement for worn-out window sash, during this period of material shortages, is outlined in a 16-p booklet. Replacement of worn-out windows with glass block panels is shown in a step-by-step series of photographs followed by several pages offering dimension tables and technical data on the correct method of installing glass block in various types of walls encountered in industrial plants. Insulux is said to be impervious to steam, corrosive vapors, or high humidity conditions.—**American Structural Products Co., Toledo 1, Ohio.**

RENTING STEEL PILING—An 8-p, illustrated brochure lists advantages of renting steel sheet-piling and gives engineering details of interlocking sections. It contains specifications for piling sections, as well as corners and connections, of the three leading manufacturers of steel sheet-piling. Data also are given on pile hammers and extractors available through the Foster Co. Six large construction projects are shown in photographs—where contractors were faced with unusual construction obstacles.—**L. D. Foster Co., P.O. Box 1647, Pittsburgh 30, Pa.**

KENNEDY PRODUCTS—This is a highly illustrated 88-p booklet with complete information on the various machines made by the company, including classifiers, conveyors, feeders, gates, grizzleys, screens, rolls, motors, and all types of crushers. Capacities, product control, sieving tests, are included. The booklet explains how all iron, steel, zinc and babbitt metal are subjected to a chemical and physical test to insure the highest degree of efficiency. Parts have high interchangeability. The company offers estimates on costs and prices for reconstructing old plants or replacing old machinery with more modern equipment.—**Kennedy-Van Saun Manufacturing & Engineering Corp., 2 Park Ave., New York 16, N. Y.**



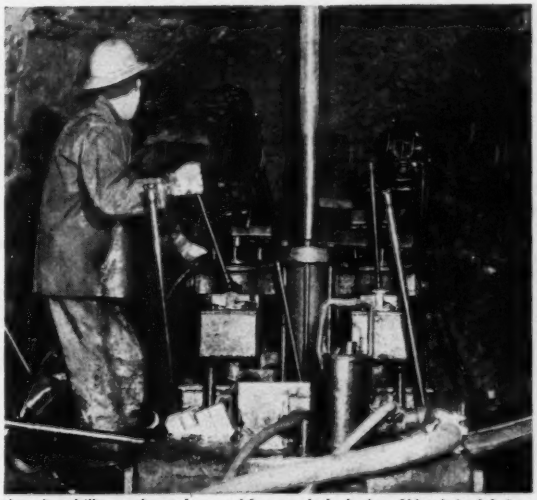
View from North Grand Island Bridge, looking west. Tunnel extends under Niagara River, about 65 ft below the surface, from the previous water intake at extreme right to a point out of view at far left. Note spray rising from Niagara Falls in center background.

Water-Supply Tunnel driven 3400 ft through rock under Niagara River

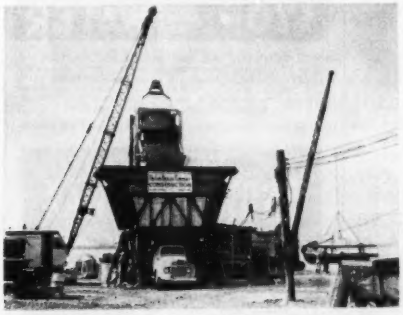
A brand new water-supply system for the City of Niagara Falls is expected to be in operation by August, 1952. To cost nearly $8 million, this job includes a modern pumping system, a new filtration plant and other improvements. A horseshoe-shaped intake tunnel, of 6½-ft finished diameter driven 3400 ft under the Niagara River, completes an interesting phase of the project which will double the water supply for this growing metropolitan area.

From a shaft 65 ft deep near the tip of Grand Island, the tunnel was driven both north and south; the northern end connects with the previous water intake, while the other end extends into the southern channel of the Niagara River at the International Boundary.

As the tunnel headings were advanced, rock was encountered all the way, most of it a variety of dolomite. Working three shifts a day, the daily advance averaged about 27 ft. The excavating of 6500 cu yd of rock required the drilling of about 105,000 lineal feet of blast holes. Bethlehem Hollow Drill Steel, fitted with detachable bits, was used exclusively on the $756,727 tunnel contract.



A modern drill-mounting at the tunnel face speeds the boring of blast holes 8 ft deep. Bethlehem Hollow Drill Steel was used exclusively in this 3400-ft tunnel driven through solid rock all the way.



Crane at the top of the shaft pulls up skip and dumps muck into hopper. Boat at right was used to ferry men out to caissons. Leo Butler Co., Inc., of Silver Spring, Md., is the tunnel contractor; George Naylor, tunnel superintendent; designing engineers, Greeley & Hansen, Chicago, Illinois.

BETHLEHEM STEEL COMPANY
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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

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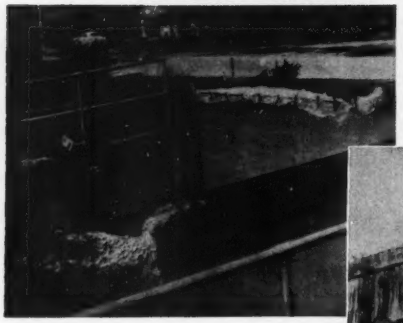
THOROSEAL *Restored* this Filtration Plant



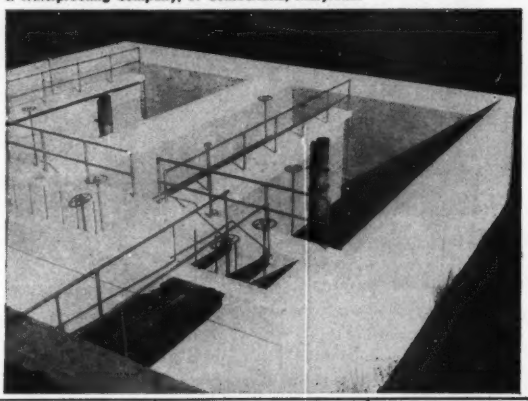
BEFORE

Example of complete break-down of masonry, due to penetration of water into body of concrete and action of frost in damp masonry.

It is amazing how THORO System products will correct a condition, such as shown in photograph. Concrete was sandblasted to remove all disintegrated material to sound concrete surface and reinforcing rods. Patching was done with THORITE Patching Mortar, bringing blistered areas to true and even lines, followed by two applications of WHITE THOROSEAL for protection.

AFTER

At minimum cost, almost ½ the cost of other methods, concrete restoration, patching and surface protection was completed with THORO System products on Filtration Plant in Keyser, West Virginia. Contractor: Standard Construction & Waterproofing Company, of Cumberland, Maryland.



WATERPLUG	THOROSEAL	QUICKSEAL
To Stop Leaks	To Seal Surface	For Beautiful Finish

Our 20-page Brochure describes, in detail, how The THORO System products can benefit you in your construction plan. Send for brochure today, which shows methods of application and how to use the material.

Standard Dry Wall Products

Box X. NEW EAGLE, PENNA.

CONVEYOR BELTS AND SYSTEMS—This is a 40-p, illustrated catalog showing standard and special types of wire-belting weaves with specifications and detailed descriptions. Power formulae and construction details are covered fully, as well as suggestions for prolonging belt life and increasing efficiency. It is a comprehensive and useful handbook on spiral woven wire conveyor belts, and complete conveyor systems by—**The Korb-Pettit Wire Fabrics and Iron Works, Inc., 1505-15 N. Mascher St., Philadelphia 22, Pa.**

CRUSHING - SCREENING - WASHING EQUIPMENT — Called Equipment Bulletin No. SMD-1, this 4-p bulletin features a line of aggregate crushing, screening and washing equipment. It covers basic production units, as well as portable and stationary crushing plants and portable primary crushing plants in the Diamond line. Descriptions, sizes and illustrations of the units are included. **—Diamond Iron Works, Inc., Dept. M, Minneapolis 11, Minn.**

CARBIDE-TIPPED HAMMER BITS—A series of before-and-after photos of carbide-tipped drill bits tell their own story in this 8-p folder. The company's Thunderbolt hammer bit is especially recommended for hard concrete, limestone, granite, sandstone, or other rock too hard for regular rotary drills. Said to fit any electric or pneumatic chipping hammer, it is recommended for use with the Company's Cyclo-Twist Rotary Drill. Concise tables contain information on standard length, specifications and prices, as well as chuck wrench specifications. — **New England Carbide Tool Co., Inc., 60 Brookline St., Cambridge 39, Mass.**

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STOP *that* WATER

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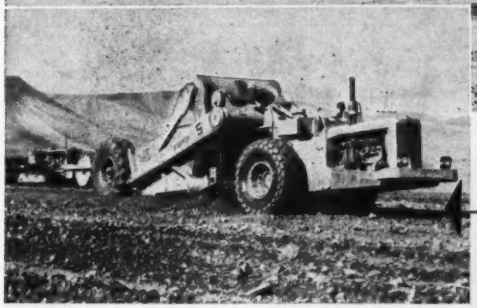
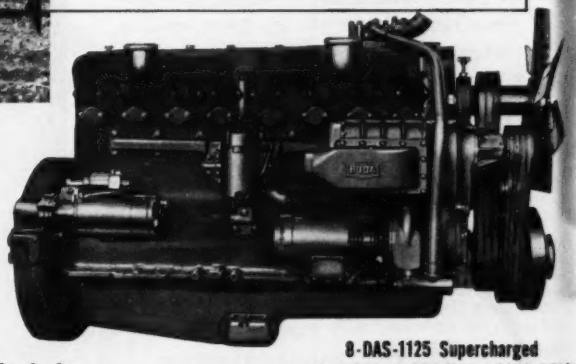
gave Campbell & Collins the SPEED, POWER, STAMINA & YARDAGE needed for the Oahe Dam Job!



BUDA 8DCS-1125 Super Diesels power giant A Tournapulls on Oahe Dam job near Pierre, S. D.

Contractors like Campbell & Collins, who demand top performance from earthmoving equipment, know from experience that they can depend on Buda Diesels to stand up to tough job conditions, year after year and give low cost, trouble-free operation.

Extra power and greater lugging ability of heavy duty Buda 1125 Super Diesels make them ideal for powering big payoff equipment like A Tournapulls and Carryall Scrapers. Loads on the large Carryalls averaged 21 pay yards; haul cycles ran 1½ miles and the Buda-powered Tournapulls completed a round trip every 13.1 minutes. Performance like that keeps owners sold on Buda Diesels!



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a bricklayer since 1917

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"The technical boys call it efflorescence. They say it's due to soluble salts leaking out of the mortar and staining the surface. Because Marquette Masonry Cement is low in soluble salts, and resists water, you won't have this trouble.

"Well, efflorescence or blooming, whatever term you use, you can forget about it when you use Marquette Masonry Cement. The entire surface keeps its smooth, even color . . . that's another reason why you should always use Marquette Masonry Cement for better masonry jobs."

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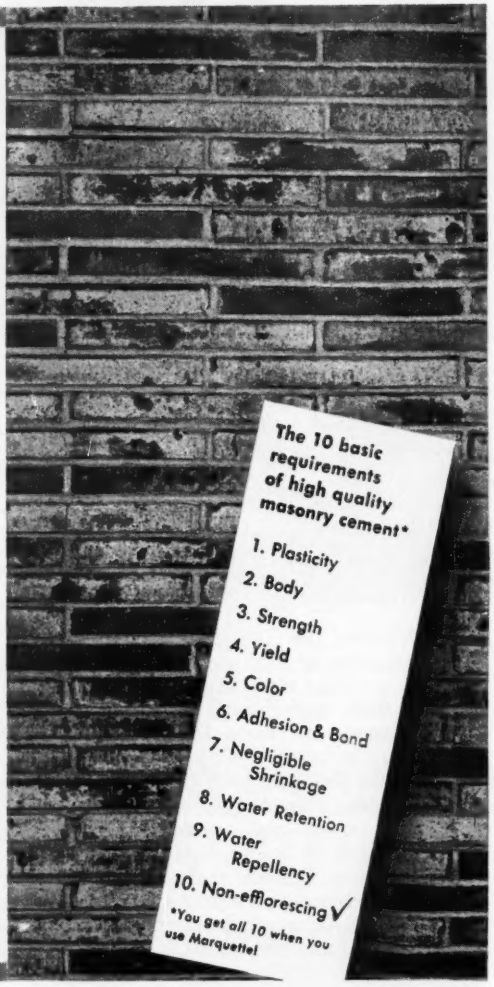
Masonry
CEMENT



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Marquette Cement Manufacturing Company

CHICAGO • ST. LOUIS • MEMPHIS • JACKSON, MISS.

PORTLAND • HIGH EARLY STRENGTH • AIR ENTRAINING • MASONRY

Any quantity of Marquette Masonry Cement will be shipped in mixed carloads with other types of Marquette Cement

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PAVING
HIGHWAY
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and PATCHING
BRIDGE DECKS
SPILLWAYS
and
MANY OTHER JOBS

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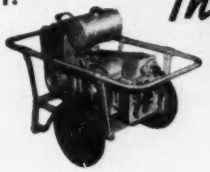

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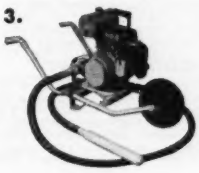

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ELECTRIC, VIBRATORY SCREED is FAR FASTER-BETTER!

It strikes off to any crown, undercuts at curb or sideform, works right up to and around manholes and other obstructions. With it center construction joints may be eliminated and full widths (up to 30') poured. Requires only two men on widest slab, due to strong tendency to propel itself. It's the only screed that can be rolled back on 4 rollers for second pass. Contractor has only to secure plank cut to proper length and crown to be set for any job. Powered by Jackson 1.25 KVA Portable Power Plant.

IDEAL VIBRATORS FOR EVERY TYPE OF JOB

1. Power Plant used with Screed, 1.25 KVA. Others of 2.5 and 5 KVA capacity — all produce both single and 3-phase 110 V., 60 C. AC and have generators requiring no maintenance or adjustment. 2. Powerful, easy to handle electric Vibrator — shafts up to 28'. 3. Finest of engine-driven flexible-shaft vibrators. 4. Revolutionary, fast, vibratory Compactor for granular soils and compaction of asphalt in drives, walks, highway widening, patching, etc. 5. Sideform Vibrator, mounts on finisher, saves better part of 2 men's labor. Write for "Pocket Guide" describing the entire line.

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ELECTRIC TAMPER & EQUIPMENT CO.
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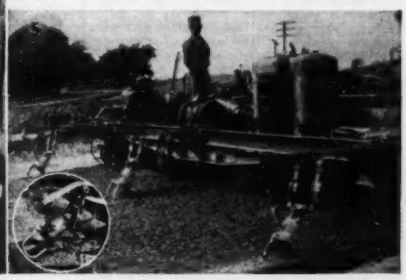

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(Classified Advertising)

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Individual Spaces with border rules for prominent display of advertisement.

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An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.

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BROWNING 1 yd. Self-Propelled, Maxi 6-Wheel Chassis, 50 ft. Boom, Only Slightly Used.

P. & H. 255A CRAWLER, ¾ yd., Like-New Condition.

INSLEY K12, CRAWLER, ½ yd. Excellent Condition.

Also Complete Stock of Army Surplus 6x6 Trucks—From 2½ to 20 Tons. Crane Mount Chassis. Army Truck Parts.

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500 HP
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200 KW AC 440V
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Write—Wire—Phone!
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Automotive And Construction Equipment
By C. W. Lindgren, 2nd Printing.

For instruction to students in Transportation, Civil Engineering and Military Operations. A needed reference book for use and study by anyone engaged in the management or ownership of trucks, loading equipment, shovels, cranes, tractors, scrapers, bulldozers, motor graders, rollers, trenching machines, paving equipment and sand and gravel equipment. Endorsed by twenty-six technical editors, 200 pages, 120 instructive sketches, $4.50, includes postage in U. S.

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City ..... State .....

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GENERAL CONTRACTOR'S EQUIPMENT
Johnson-Sampson Construction Co., Inc.
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New Roebling Tramway Track Cable.
700 feet 1¼" Smooth Coil 1 x 37
860 feet 1¼" Smooth Coil 1 x 37
1516 feet 1¼" Smooth Coil 1 x 37
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FS-2333, Construction Methods & Equipment
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Of Construction Methods and Equipment published Monthly at New York, N. Y. for October 1, 1951.

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Sworn to and subscribed before me this 6th day of September, 1951.

ELVA G. MASLIN
[SEAL]
(My commission expires March 30, 1952)

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Position of the control zone in a Traylor TY Reduction Crusher accounts for its amazing production efficiency

TRAYLOR CURVED CRUSHING SURFACES check lifting and churning of material by applying power as a direct crushing force to obtain a more uniform product on less power-per-ton produced.

TRAYLOR BELL HEAD and CURVED CONCAVES place the crushing zone of smallest volume here, well above the opening where packing and choking commonly occur. Capacities of all succeeding zones are progressively greater . . . *free discharge is assured.*

Observation of a large number of installations has disclosed that Traylor self-tightening bell head and curved concaves enable operators to consistently produce large tonnages of small, uniform product with low percentages of oversize and waste fines. More efficient application of crushing force reduces wear-per-ton and power-per-ton factors. A Traylor TY Reduction Crusher introduces unsurpassed efficiency to any secondary crushing operation.

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409 MILL ST., ALLENTOWN, PA.

I want to see how a Traylor TY will cut my reduction costs.

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A "TRAYLOR" LEADS TO GREATER PROFITS

Traylor

Rotary Kilns, Coolers and Dryers · Grinding Mills Jaw, Reduction and Gyratory Crushers · Crushing Rolls

Methods Memo . . .

THE BOOM WAS LOWERED by the National Production Authority on October 15 when it withdrew priority and allotment assistance from the Delaware Avenue Holding Corp., Columbus, Ohio, for 90 days. In addition, the firm is forbidden to use any steel, copper or aluminum during this period. NPA charges the company with violating Construction Order M-4 through the unauthorized use of 22 tons of structural steel beams in the construction of an office and warehouse building in Buffalo, N. Y. The respondents admitted the charge. Delaware Avenue Holding Corp. had received permission to build the two-story structure under specifications that called for wood beams and masonry instead of steel, according to NPA officials.

MODIFICATION OF EQUIPMENT by contractors frequently is carried out under the supervision of the job foreman or superintendent, with the help of a convenient machine shop. This practice works well on routine conversions, but in more complex matters—such as the major rebuilding of an old Marion crane for the Drilled-In Caisson Corp. (see page 42)—the trend among contractors is to approach their special equipment problems from an engineering angle. The over-all savings far outweigh the added engineering costs.

WHY DOESN'T some smart equipment manufacturer come out with an efficient shaft mucking rig? If you don't think there is a need for such equipment, take a look at what Perini-Walsh dreamed up for sinking two shafts at Niagara Falls, Ont., described on page 59 of this issue.

GENERAL - SHEA - MORRISON are going at top speed this year at Hungry Horse Dam. They poured the 2,000,000th yd of concrete in late August, and expect to reach about 2,400,000 yd by the end of this working season. This puts them some 200,000 yd ahead of schedule, and leaves only 700,000 yd to top out next year. Good organization, good equipment and good weather are the answer to the exceptional concreting progress.

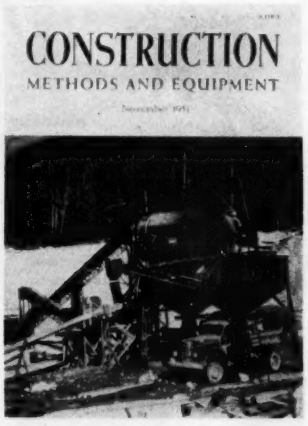
PHYSICALLY HANDICAPPED WORKERS would seem to be out of place on most construction jobs, but experience has shown that they frequently do a better job than men with unimpaired physical faculties. And they can be employed to advantage in various places. General - Shea - Morrison, primary contractor for Hungry Horse Dam, uses the physically handicapped in such major posts as cableway operators and signalmen. Other jobs held successfully include dock foreman, concrete checker, welder and electrician.

MUCH - APPRECIATED ASSISTANCE is coming from two large manufacturers in the drive for better roads and increased highway construction. General Motors Corp. has inaugurated an educational program for the public through its dealer and field organization. The program features a motion picture, "Let's Get Out of the Muddle," dealing with the highway problem which is available for showing before any interested group. Goodyear Tire & Rubber Co. is running a series of magazine and newspaper advertisements on the importance of highway transport. It points up the bottleneck of inadequate roads and calls for action on more new construction.

MORALE BOOSTERS FOR CONSTRUCTION CREWS often come in the form of relatively simple applications and usually pay good dividends. One such was developed during the sewage disposal construction program for East Bay Municipal Utility District, Oakland, Calif., which called for deep, open cuts through soft tidal mud. Stolte Construction Co. and United Concrete Pipe Co., joint contractors on one phase of the job, fitted three stall showers, a large wash tray, a 40-gal water heater and a small heating stove into a large van-type truck trailer, which follows the job. The men can get a thorough washdown at the end of each shift right at the job-site. Water is obtained at nearby hydrants, and waste is discharged into storm sewers or dissipated into the marshy soil.

EXCESSIVE RAINFALL this year has raised havoc with most construction jobs being built between the Rocky Mountains and the Missouri-Mississippi Rivers. Extreme drought has prevailed west of the Rockies. Maybe we should have built all those Trans-Continental Divide tunnels with pivots so we could run the water westward instead of eastward when the occasion demands.

A NEW ENGINEER DISTRICT, known as the Atlantic District, has been established by the Army Engineers. Temporary headquarters are located at 80 Lafayette St., New York City. Col. Charles T. Tench, formerly Fifth Army Engineer at Chicago, will be district engineer. Atlantic District, under jurisdiction of the North Atlantic Division, will handle off-continent military projects in the Atlantic, from Bermuda north—except projects already assigned otherwise.



On the Cover . . .

High in the rockies of Colorado, at an elevation of 9,400 ft near Winter Park, a Pioneer 305-W Continuflo gravel plant processes concrete aggregates for the Denver Water Board. It produces washed and graded sand and two sizes of crushed, washed and sized rock. The conveyor alongside the plant bins takes oversize from the revolving screen and delivers it to a crusher, from whence reduced material is put back on the main feeder conveyor. The pipe leading off to the left is a flume carrying away excessive fines, dirt and other foreign matter from the plant's sand drag.

The Water Board set up the crushing-washing-screening unit to supply its construction projects on the western slope of the Continental Divide when freight charges on imported aggregates proved prohibitive—about 1½ times the cost of producing the aggregates locally. The efficient Pioneer plant is managed by H. L. McPeters, foreman of the Board's Moffat Tunnel Division-Western Slope, and is operated by R. L. Sankey.

Masterbuilt Floor in Hinde & Dauch Paper Co. Box Plant, Richmond, Va. Archt.—Carneal & Johnston; General Contr.—Doyle & Russell—both of Richmond, Va.; Floor Contr.—The Vannier Co., Buffalo, N. Y.

4-6 Times Longer Floor Life with the MASTERPLATE "Iron-Clad" Concrete Floor

The good performance of Masterbuilt iron armored concrete floors in two other Hinde & Dauch plants resulted in the company's decision to install this modern industrial floor in the fine new plant shown above.

Long floor life — 4 to 6 times greater than the best plain concrete floor — is only one of the reasons why many million square feet of Masterplate Floors have been installed in plants of all types during the past twenty years.

In addition to great wear resistance, Masterplate Floors have the following advantages:

- SPARK RESISTANT†
- STATIC DISSEMINATING†
- NON-SLIP FINISH
- NON-DUSTING
- EASY-TO-CLEAN
- CORROSION RESISTANT
- BUILT-IN-COLOR — NON-COLORED AND 11 ATTRACTIVE COLORS
- LOW COST

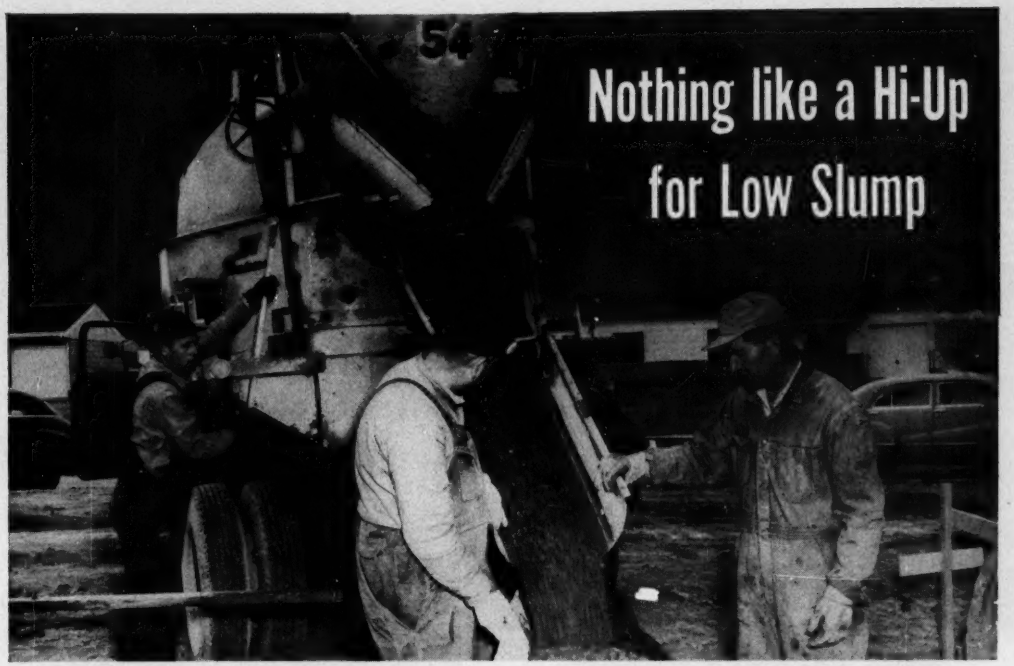
† spark-safe floors with 1.0 to 1.25 lbs. Masterplate per square foot of floor.

These advantages of the Masterplate Floor result from the *thick* iron-concrete armorplate produced by embedding specially processed, size-graded iron particles, combined with Master Builders' cement dispersing agent, in the *surface* of concrete while still in a plastic condition.

Ask for full information and pictorial directions on Masterplate for new floors and resurfacing old concrete floors; also free floor survey.

the MASTER BUILDERS Co.

CLEVELAND 3, OHIO — Subsidiary of American-Marietta Company — TORONTO, ONTARIO



All over the country, Worthington-Ransome Hi-Up Truck Mixers are out-performing other makes!

Photo of 4½ cu yd Worthington-Ransome Blue Brute Hi-Up Truck Mixer fleet operated by Concrete Inc., Denver, Colorado.

Photo of 5½ cu yd Worthington-Ransome Blue Brute Hi-Up Truck Mixers operated by Lattanzio Transit Mix Co., Inc., Schenectady.

Compare them on the basis of charging and discharging time . . . compare them on the basis of maintenance—

You'll find that Worthington-Ransome Blue Brute Hi-Ups score way ahead of other makes.

You'll surely want to experience results like these—

Fred D. Hoppe, vice-president, Concrete Inc., Denver, says, "Charging and unloading time is the lowest in our fleet of 26 units. We particularly like the way they discharge low and no-slump concrete. We experience less 'down time' with these machines than anything else in our fleet." Mr. Hoppe purchased *six more!*

Lou Lattanzio, Lattanzio Transit Mix, Schenectady, says of his 5½ cu yd Hi-Ups: "We are very pleased with the discharge rate even with low-slump concrete. There has been no appreciable mechanical trouble." Mr. Lattanzio "expects to standardize on Hi-Ups."

So join the growing list of Hi-Up fleets, which include Pine Hill Concrete Mix, Inc., Buffalo—over 40 Hi-Ups; Southern Materials Corp., Richmond and Norfolk—over 20; Buzby Brothers, Westville, New Jersey—over 20; Fenton Materials Co., San Diego—over 20.

See your nearby Worthington-Ransome distributor for a demonstration. Worthington Pump and Machinery Corporation, Construction Equipment Division, Dunellen, New Jersey.

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IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB